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AMERICAN SURVIVAL GUIDE

VOLUME 7, NUMBER 10 OCTOBER, 1985

Page 26



Page 56



- 6 To The Point**
There are survival applications to moving your residence.
- 8 Survival Line**
Reports on survival matters around the world.
- 10 Book Reviews**
Being safe in an unsafe world; disaster handbook.
- 12 New Products**
Survival equipment for use today or in an uncertain future.

- 14 Survivalist Directory**
A confidential listing for survivalists seeking communication.

- 15 Air Travel Security**
Why are Americans so vulnerable to terrorism?

- 20 Defensive Canes**
Protective walking sticks to deter would-be attackers.

- 24 EMT**
These medical skills should be a survival priority.

- 26 Freshwater Foraging**
Part I of a series on the methods and gear for fishing.

- 28 Explosion**
These dangers are all about us. Watch out for them.

- 30 Rocky Boots**
A pair of lightweight hikers get a thorough workout.

- 32 Citizen Defense Forces**
Government plans for organizing state militias.

- 34 Game Sausage**
Here's how to make a tasty food with game.

- 36 Swamp Fox**
A unique survival slingshot with many functions.

- 38 Sight-Aid**
Put bright sights on your firearms for better aim.

- 43 Trailbreaker**
The Trailbreaker walking system is for hikers/strollers.

- 46 Back To School Safety**
Crimes against kids: guidelines for staying safe on the streets.

- 52 Generator**
Roll your own electrons, have energy independence.

- 54 Navy Survival Training**
This school helps downed pilots stay alive.

- 56 Galil .223**
An outstanding assault rifle from Israel.

- 74 Classified Ads**
Messages of interest to survivalists.

- 75 Mail Call**
Letters from the survivalist community.

- 76 Poisonous Plants**
Learn what common plants present a lethal threat.

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COVER:

American airlines and passengers are targets of terrorists. See page 15 (Photo by Martin Hasa).

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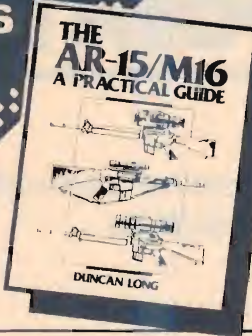
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THE AR-15/M16: A PRACTICAL GUIDE

by Duncan Long

The AR-15 is so revered that nations around the globe have adopted it—or many of its features—for use by their own armies. Now comes *the* definitive book on the rifle that has been the inspiration for so many modern assault rifles. Should you wish to build your own AR-15/M16 or convert it to auto fire, Duncan Long supplies you with lists of parts and tools needed for the task and detailed step-by-step instructions. Virtually any accessory you may wish to acquire for your AR-15 is listed. Exploded diagrams for field stripping are included, as are parts suppliers and sources for additional product information. Invaluable to the M16 owner, this comprehensive book also covers assembly and disassembly, conversion kits and modifications, troubleshooting, ammunition, combat use, military use and testing, night-vision equipment, and more. 8½ x 11, softcover, illus., photos, 168 pp. **\$16.95**



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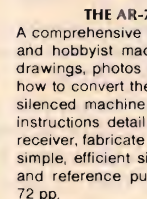
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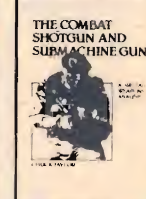
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by Chuck Taylor

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by Galen Geer

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TO THE POINT

*A survival exercise, knowns and unknowns,
reliabilities and unreliabilities . . .*

CHANGES AND surprises are the stuff from which survival is created. I'm no longer editorial director of *American Survival Guide*. My wife, Sally, is no longer a secretary for a medical care firm. We've headed for the hills—7,000 feet above sea level, exactly—and well away from urban civilization.

Getting here, if viewed as a survival experience, was worthwhile in terms of learning about knowns and unknowns, reliabilities and unreliabilities, and forethought—or lack of it—for survival.

We'd decided some months ago that if we were to take a shot at being true survivalists, we should do more than give lip service to survivalism. The least we could do was to relocate from Los Angeles—a prime nuclear target, a potential earthquake disaster area, and an atmospheric pollution catastrophe.

We used our personal computer to compile resumes and lists of references. Word processing features of the PC allowed us to tailor these documents to specific potential employers quickly. We answered "Help Wanted" ads in newspapers in regions we believe to be less subject to cataclysm of all sorts, and relatively free of atmospheric pollutants and toxic wastes.

To be brief, we landed the kind of couple position we had been seeking. We quit our jobs, sold our house, and left our city office cubicles for out-of-doors high country.

The move here was a survival experience. Had we been participating in a true "bug-out" to escape some event, whether man-created or natural, we wouldn't have made it. As it was, we arrived here only by reason of help from another survivalist.

Three vehicles were involved in our exodus: my 4WD pickup towing a 2-wheeled trailer, my wife's possession-stuffed 4WD station wagon, and my kid the cop's 4WD pickup also loaded with household items. As should survivalists on the move, all three vehicles were CB radio equipped.

(An aside here is that I bought my pickup used. I have owned it for three years, and I thought I knew it mechanically from stem to stern. Wrong!)

With the trailer, I led off in my truck. Sally was in second convoy spot. My son brought up the rear. We turned out of the

driveway, made a right turn for the freeway, and progressed a total of three blocks before the left rear bumper bracket parted, causing the trailer to weave to and fro violently on its safety chains.

This was an unknown. I did not know that the previous owner of the truck had fractured the bumper bracket and had had it welded ineptly—no penetration of the metal, so the brittle surface weld cracked under my trailer load. My son's pickup, however, is fitted with a hitch ball, so we switched the trailer to his truck and continued, exchanging an unknown for a known. I later fabricated a pair of bumper brackets for my truck from 0.25-inch flat steel, exchanging the broken unknowns for new knowns. The unreliability of my truck was taken over by the reliability of my son's pickup to accept and haul the load to our destination. We arrived without additional mechanical troubles.

But as we off-loaded the last of our homestead gear in our new dwelling, all who had participated in the move expressed pangs of hunger.

Here there is no McDonald's—and it was too late to set our snares for local game. We elected to heat some cans of soup. We had the cans of soup—but no can opener.

This is, pure and simple, errant lack of forethought: we could have packed simple things, soup, bread and apples, together with our eating utensils, ready for easy access.

As it was, I carry a large lockback folder, so I sacrificed the blade to can opening. This edge must now be re-sharpened to make the knife survival useful once again.

Little things! How sturdy is *your* bumper, should you need it? Do you really *know*? Do you carry a knife that will open cans?

In other circumstances, our bug-out might have ended at three blocks, and/or we could have been unable to take precious nourishment.

We have overcome these small unknowns with hard steel knowns, we have exchanged some unreliabilities for reliabilities, and we vow in all our endeavors to give greater forethought because, with lack thereof, we cannot survive.—Dave Epperson ●

One day, survival may depend on the right reading.

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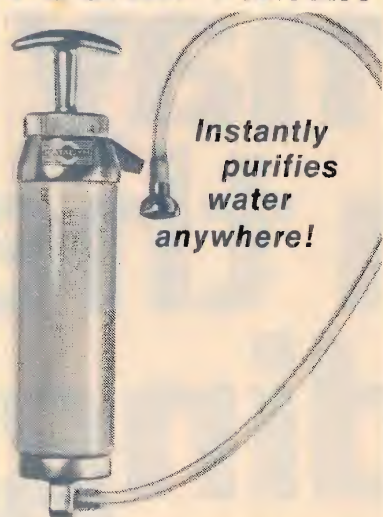
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U.S. terrorism threat, GAO criticizes Radio Free Europe, hurricane worries, proposed MAC-10 ban . . .

IN A RECENT two-day conference on terrorism held in Washington DC, the director of the Federal Emergency Management Administration (FEMA), Louis Guifrida, acknowledged that the U.S. was "extremely vulnerable" to the current and future weapons of terrorism.

The conference, sponsored by the New York State University Institute for Studies in International Terrorism, focused on the growing threat of terrorist groups resorting to nuclear, chemical, or biological attacks within the U.S.

As the membership of nations in the "nuclear club" grows, so too does the possibility of a terrorist incident involving nuclear materials. A terrorist group operating on its own or with the assistance of an outlaw state such as Libya, would need only to acquire nuclear material to pose a major threat. A group need not build a bomb with the material as the toxicity of the material is so great that dispersal of the material over a city would cause almost as many deaths as would an atomic explosion. According to experts, chemical and biological agents can also be produced with little difficulty by individuals or groups.

The conference itself was attended by experts and professionals in the field of terrorism. It was closed to the public.

Toilet Paper—Thousands of Bibles donated by a U.S. church and sent to the Hungarian Reformed Church in Romania have been pulped and turned into toilet paper, charges the pastor of the donating church.

Saying that this was a "sign of the total contempt for religion" practiced by the communist government of Romania, Alexander Havadtoy, pastor of the Calvin United Church of Christ in Fairfield, Connecticut, condemned the action.

No official comment has been made by the Romanian embassy in the U.S.

Sticks and Stones—Radio Free Europe broadcasting to the communist dominated states of Eastern Europe and Radio Liberty which broadcasts to the Soviet Union are used to criticism. Constantly assailed by the communist bloc as the voices of imperialism, Radio Free Europe and Radio Liberty ignore the criticism and occasional jamming of their broadcasts.

Now, though, comes a new voice of criticism, the U.S. government's General Accounting Office (GAO). In a report the GAO assails RFE and RL for "violation" of broadcast guidelines. The alleged viola-

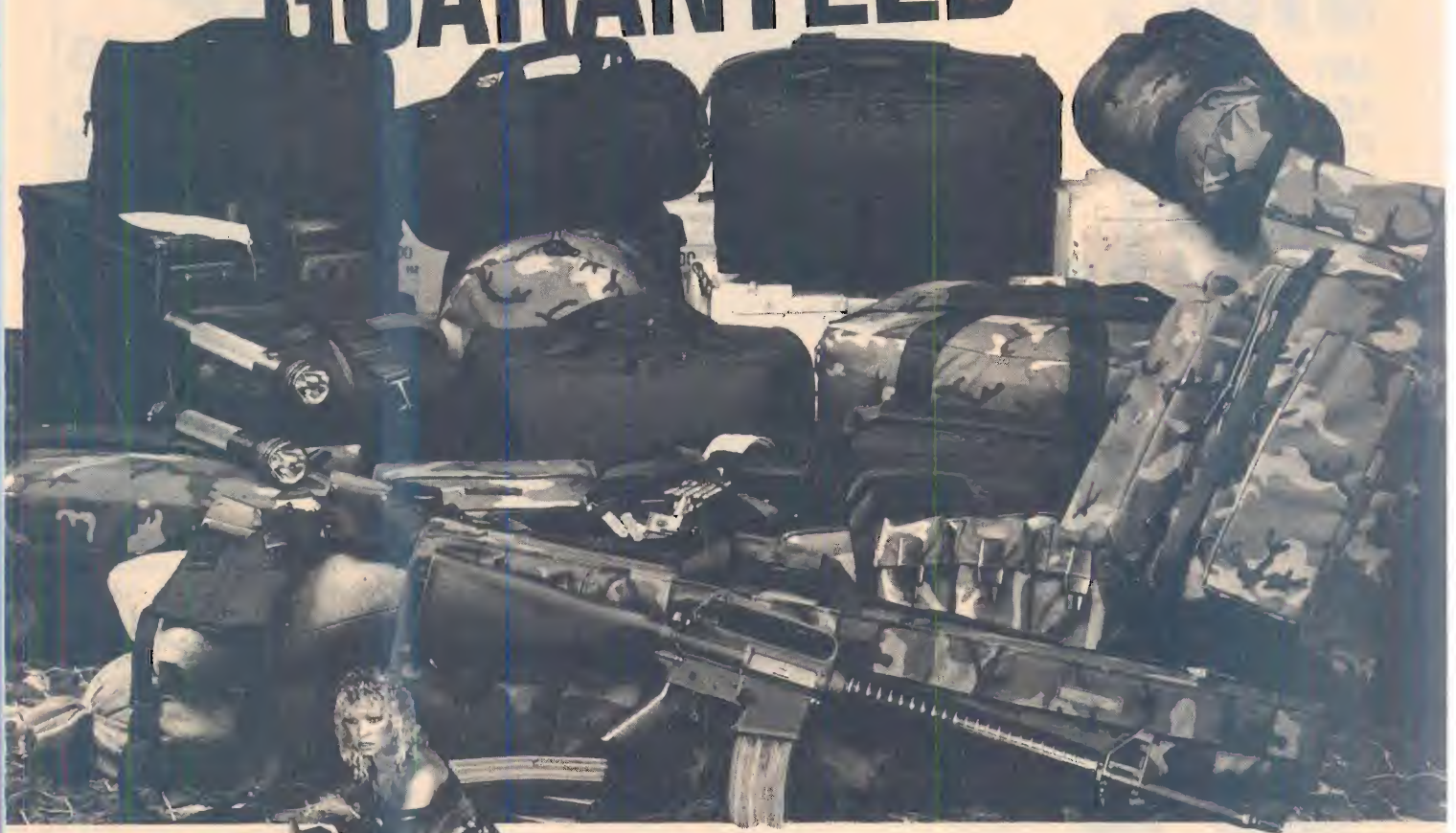
tions: a reference to Andrei Gromyko as a bandit, comparing former Soviet officials to Nazi war criminals, suggesting violent action by Soviet soldiers against their officers in Afghanistan, and using an obscenity to describe a Polish government official.

Hurricane Worries—"We know a major storm is going to happen; it's just a matter of when and where." Those words, spoken by Gordon Guthrie the director of the Florida Division of Emergency Planning, echo those of other experts along the Gulf Coast and the eastern seaboard. From Massachusetts to Texas emergency planning officials cite the dramatic increase in development along hurricane prone coasts as a potential disaster waiting to happen. Officials say that despite the occasional deadly hurricanes in the past few years, the U.S. has not seen a really massive hurricane in the last two decades. Because of a growing reluctance by new coastal residents to believe and prepare for a major storm, planners say a severe hurricane has the possibility of killing thousands.

Taking Your Guns—The National Coalition to Ban Handguns has enlisted the aid of Representative Robert G. Torricelli, Democrat from New Jersey, in the introduction of a bill in the House of Representatives which would require owners of Ingram MAC-10s to surrender them to the government or face federal prosecution. The bill, H.R. 2024, would give a MAC-10 owner 90 days to turn in his weapon. There would be compensation paid by the government. The rationale for this bill is that the MAC-10 can be converted to an automatic weapon with relative ease.

The NRA sees the bill as a first step toward confiscation of all guns and strongly opposes the bill. Since most survivalists have on hand some sort of weapon, with the Ruger Mini-14 and Colt AR-15 being particular favorites, this bill has major significance for the survivalist community. Should this bill succeed the obvious next step by the anti-gunners would be the inclusion of the Colt and Ruger onto the prohibited list. We urge our readers to let their elected representatives know how they feel about his "first step." Your congressman can be contacted by writing to him at the following address: Congress of the United States, House of Representatives, Washington, D.C. 20515. ●

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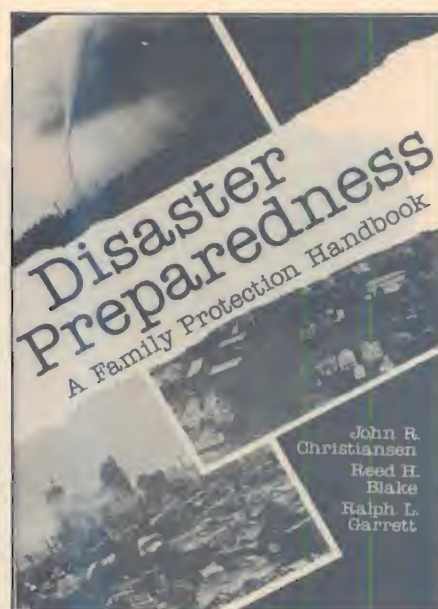
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BOOK REVIEWS



How to be Safe in an Unsafe World, by Donald D. Gilbert; Horizon Publishers & Distributors, Inc., Dept. ASG, 50 South 500 West, P.O. Box 490, Bountiful, UT 84010-0490; (801) 295-9451; 111 pages, hardbound; \$8.95.

Today's world is one of high crime rates and vandalism. This book gives specifics about what you can do to protect your family, your valuables and your peace of mind. It offers help to provide greater security for yourself and those you love, your home and neighborhood, church or business. It offers alternatives to the use of guns for protection. Included are suggestions for securing doors and windows, constructing sturdy roofs and fences, the effective use of lighting or using trees and shrubs to your advantage. There is also a chapter on training your dog to be a greater source of security without turning the dog into a menace to innocent people. The author, a professional security consultant and private investigator, has compiled a variety of protection methods in this book that relies on brains, not brawn, for security. Other areas covered are alarm systems and signals, personal protection, security for farm and rural areas, retail stores and gas stations, and a section on internal theft prevention and detection. *How to be Safe in an Unsafe World* would be a valuable addition to any survival library.



Disaster Preparedness, A Family Protection Handbook, by John R. Christiansen, Reed H. Blake and Ralph L. Garrett; Horizon Publishers & Distributors, Inc., Dept. ASG, 50 South 500 West, P.O. Box 490, Bountiful, UT 84010-0490; (801) 295-9451; 184 pages, hardbound; \$13.95.

Written for the average American family, the book provides instructions for dealing with many kinds of emergencies, natural and man-made. Researched and written under a federal government grant, the book is a compilation of private and official government reports, documents and publications. The authors explain how and why emergencies happen and who is most likely affected by them. The book suggests long-range plans for coping with disaster. It is also a quick reference guide for use during an actual emergency. Special emphasis is given to dealing with natural and man-made disasters such as tsunami waves, tornados, floods, forest and building fires and nuclear war. There are chapters on preparing for emergencies, dealing with basic necessities, handling emergency medical and emotional needs, natural hazards, man-made hazards, nuclear weapons threat, fallout shelters, communication and protective strategies and emergency assistance. *Disaster Preparedness* is another important asset to a survival library and to any family concerned with preparation for times of crisis, and with teaching people to prepare and effectively deal with disaster.

Continued on page 66

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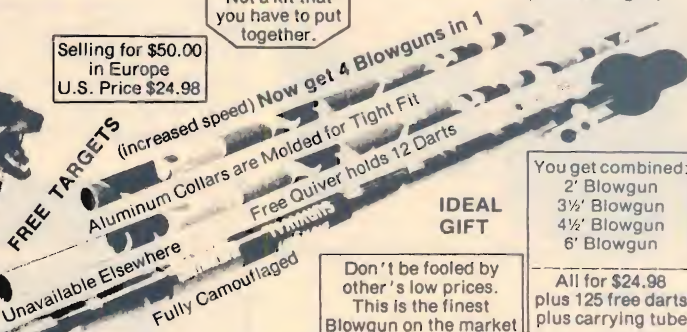
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Velvet Glove

Beeman Precision Arms is offering felt vise pads that serve as a "velvet glove" for sensitive materials held in a vise. The pads are thick rectangles of stiff, durable wool felt that attach to steel vise clamps magnetically. Once in place, the pads provide a protective cushion for any pressure-sensitive material that is necessary to clamp in a vise. Convenient magnetic attachment makes the pads easier to work with than the jury-rigged arrangements most commonly used. Three lengths are available: 100mm (4 inches), 125mm (5

inches), and 150mm (6 inches), for a variety of vises. Suggested retail prices for a pair of Beeman Felt Vise Pads are \$9.95 for 100mm, \$13.95 for 125mm and \$14.95 for 150mm. Contact Beeman at 47 Paul Drive, Dept. ASG, San Rafael, CA 94903; phone (415) 472-7121.



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Assault Systems Backpack is designed for special operations. It features quick-ditch capabilities; adjustable chest/sternum strap and 2-inch web belt with Fastex buckle; carrying handle; sewn-in pads; three external pockets; eight exterior ALICE store mounts for attaching extra gear; a built-in, breathable posture pad; Fastex quick-release main compartment cover; and storm flaps for all zippers. It weighs just 3 pounds, 11 ounces empty and will carry loads from 25 to 60 pounds. Unconditionally guaranteed, the backpack carries a suggested retail price of \$150. For more information, call (800) 325-3049 or write Assault Systems, 869 Horan Drive, Dept. ASG, St. Louis, MO 63026.



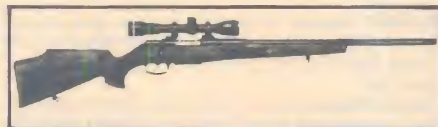
PortaShield

The PortaShield anti-ballistic attaché case has been developed by National Protective Products, Inc., P.O. Box 584, Dept. ASG, Oxford, MA 01540. The PortaShield attaché case, with a suggested retail price of \$1,695, can be readily converted into a personal anti-ballistic shield with the flick of a finger latch. The shield provides a protective area measuring 34½ by 16 inches. On deployment, bullet-resistant panels spring from the upper and lower edges of the case. A third panel is fixed in the body of the case to form a continuous protective screen. PortaShield panels absorb the energy of projectile hits outside the body perimeter. The shock of projectile impact is dispersed throughout the protective case and the carrier's hands and arms. The hard armor is made of DuPont Kevlar. In a privately conducted test, a panel withstood without penetration nine repeated strikes fired from weapons ranging from a 12-gauge shotgun to a .22 caliber rifle, including .357 and .44 magnum handguns. For more information contact National Protective Products.



Survival Storage

Ex-GI ammo boxes? Nope! They're all new "Stronghold Utility Boxes" from Brockway Standard, Inc., Dept. ASG, 16 Daniel Road, Fairfield, NJ 07006. The boxes have a hermetical sealing lid that keeps out moisture, dust and air. Available in standard Forest Green or optional Blaze Orange, the boxes are sized Small (11 x 3-3/16 x 7-1/4 inches), priced at \$10.50; Medium (12 x 6-3/32 x 7-1/2 inches), priced at \$13.00; Large (12 x 6-3/32 x 10-6/16 inches), priced at \$15.00; and Extra Large (12 x 6-3/32 x 13-11/32 inches), priced at \$16.00. All prices are suggested retail. Survivalists who have used the GI surplus counterpart of the Stronghold boxes know they're right for caching, ammo and powder storage, and just keeping things dry over the long term.



Varmint Hunter

Beeman Precision Arms, Dept. ASG, 47-PR Paul Drive, San Rafael, CA 94903; phone (415) 472-7121, now the sole distributor of Krico rifles in the U.S., introduces the Beeman/Krico 640 Deluxe Varmint Rifle. This rifle is one of Beeman/Krico's special series of match hunters—field guns built to the standards of match guns. In the "set" mode, the trigger lets off with the ease of a fine, match trigger. Trigger weight is measured in ounces, so the shooter seems to just "think off" the shot with the slightest squeeze of his finger. The rifle also features interchangeable trigger modules, so if the shooter wishes, he can drop in any one of the several different types of trigger systems. The 640's rifled, heavy bull barrel dampens vibration and adds extra control and steadiness to the shooter's aim. The barrel is free floated in a walnut stock to help squeeze out the added bit of accuracy. The stock has a rosewood forearm tip and

grip cap, high Monte Carlo comb and full sweeping cheekpiece. The grip is deeply checkered and fits the hand extremely well. The 640 also offers a jeweled, bolt action, detachable 4-shot box magazine and a rocker type safety. The 640 is available in .222 Rem. and other popular calibers. Suggested retail price is \$995. Contact Beeman for further information.



High Power Scopes

Swarovski Optik now offers a 1.5x14 power Cobra Scope for sniper and semi-automatic assault rifles. Designed for improved combat efficiency, the Cobra Scope is compact and lightweight. It allows the user to see both target and reticle at the same time. Annoying lateral light is eliminated and high magnification makes more target details visible. Available in two variants, the scopes feature a centered reticle, quick setting bullet drop compensator, range finder, visual adjustments, click setting with cover, adjustable reticle for point of impact correction and rubber rings that protect both ocular and objective lenses. A short focal length means the scope is parallax free for 300 meters. The Cobra Scope is waterproof, shock-proof and corrosion-resistant. The optics are designed to withstand firing recoil and provide a sharp, high contrast color-true image even in adverse light conditions. The Cobra Scope can be used with any weapon firing NATO standard 7.62mm ammo. Mountings are available for Heckler & Koch 63, FN FAL rifle, M16 rifle, AR-15 rifle and AUG rifles. Special mountings can be produced for other weapons. The retail price is \$325. For additional information write Swarovski Optik, Dept. ASG, One Kennedy Drive, Cranston, RI 02920, or phone (401) 463-6400.



Devil Dart

The Devil's Dart is custom knifemaker Pat Crawford's new entry into the con-

cealed weapons market. Small but strong, the blade is triangle shaped for strength and easy penetration. The handle is knurled for a sure grip. Each Devil's Dart is individually hand ground. It is available in either sandblasted 440c stainless steel or Parkerized tool steel. It is supplied with a versatile sheath made from nylon, elastic and Velcro which can be worn on the arm or on the leg. The arm model is 7 inches overall and sells for \$65. The leg model is 8 inches overall and sells for \$75. Pat Crawford, Dept. ASG, 205 N. Center, West Memphis, AR 72301, phone (501) 735-4632, will provide additional information.



Storage Program

If you're not sure how much, or even what you should have in your long-term storage plan, there is a service available to help you. Stutzman and Associates, a California-based company, has a computerized food storage program that will give you a customized computer printout of what you need for your own or your family's needs. The program provides information on types and quantities of foods your family will need based on their ages and sex. There is also information on putting together improvised survival kits for your home, car, retreat or bugout pack, and other necessary non-food storage items and equipment. The cost of this information is \$25 plus \$3 for postage and handling. To order, enclose your own and your family members' sex and ages and note any medical problems or special needs. Mail check or money order to Stutzman and Associates, 777 South Main St., Suite 57-124, Dept. ASG, Orange, CA 92668. Allow six to eight weeks for processing and delivery. Personal checks will require an extra two weeks to clear. California residents add 6 percent sales tax. No data or mailing lists will be made available to anyone outside the company. ●

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ASG 1122

Franksville, Wisconsin, small, family oriented group in southeastern Wisconsin looking for like-minded people, families or individuals, interested in survival within 20-mile radius of Racine.

ASG 1123

San Pedro, California, desires to join or organize survival group in the Southern California area.

ASG 1124

Gainesville, Florida, ex-Army pharmacy tech/medic and fire-arms enthusiast seeks contact with survivalists or survival groups in Gainesville area.

ASG 1125

Tucson, Arizona, 17-year-old survivalist wants contact with other teenagers around the country to create nationwide teenage survivalist network.

ASG 1126

San Diego, California, dedicated survivalist desires correspondence with other survivalists in Southern California area.

ASG 1127

Canada, American living in Canada wants contact with survivalists in Vermont/Maine/New York area to exchange information and possibly join survival group.

ASG 1128

Red Bluff, California, would like to hear from anyone interested in joining a survival group for long-range self-sufficiency on 160 remote acres in Northern California.

ASG 1129

Llano, California, desert survivalist wishes to share information and knowledge with others, emphasis on alternate energy and political alternatives.

ASG 1130

Picayune, Mississippi, survivalist would like to communicate with other survivalists in Picayune area and surrounding states.

ASG 1131

Maplewood, Minnesota, Christian survivalist seeks others of like mind to communicate with; stresses practicality; no racists.

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Avoid A Hijacking:

AIR TRAVEL SECURITY

What can be done to stop terrorists . . .

By Ryan Quade Emerson



A BOAC VC-10 jetliner is blown up at Dawson's Field, Jordan, by Arab guerrillas who hijacked the plane. The TWA and Swissair planes met similar fates. The hijackers took the passengers off the planes before destroying them. (UPI/Bettmann Newsphotos).

GOVERNMENTS around the world and major corporations have a bad habit of getting people killed because they are too cheap or lazy to do anything about establishing proper safeguards to prevent a disaster from taking place.

After the June 1985 airplane hijacking and terrorist incident in Lebanon, certain things became painfully evident while elected and appointed public officials and chief executive officers in private industry desperately tried to cover their collective posteriors.

The flight attendants I interviewed said that for years flying professionals have openly criticized the use of private security firms to control airport security. "We have been very unhappy about this for some time," one senior plane crew member said. "We want all the security people to be federal employees. We do not want gate security to be the responsibility of the airlines."

As it is, with the airlines paying for security personnel to conduct searches of passengers and luggage, airline supervisors often tell security workers to let people through with carry-on luggage that does not conform to regulations. The security guards have no authority, they let these things go on. "If they were government employees wearing official badges of the

United States of America they would command more respect." "They would have an official status, giving them the authority to cite regulations to airline supervisors and passengers . . . they would also probably be better paid and trained."

Professionals Complain—The attendants' complaints are mild compared to those of professional experts who have conducted security evaluations in the past for both airline management and officials who run the airports. In almost all cases the findings of these investigations and the recommendations that accompanied them were seldom implemented because "they cost too much money," as I was told by some of the firms that were hired to make the probes. I was allowed to read some of the reports and they contained the following:

1. Security machines, such as X-ray devices and metal detectors, are now very sophisticated but are too often poorly operated and maintained. To save time and reduce false alarms in some airports, metal detectors are often set with lesser sensitivity so that weapons could go undetected.

2. Security quality varies widely. Contrary to popular belief, United States airport security is not considered among the

best. Israel and communist countries are regarded by experts as having the best systems, third world nations the worst.

3. The weakest links in the system are the personnel responsible for airport security. Equipment operators often receive the minimum wage; boredom and inattention are frequent. Maintenance workers and catering personnel are often not screened adequately before they are hired or when they go to work.

4. Few airports examine all checked luggage for explosives, although technologies and procedures have existed for years to accomplish this. This is the most common route for bombs.

5. New technology representing a substantial leap forward from present equipment has been available since 1980 but the U.S. Congress has not increased the budget for the Federal Aviation Administration and the private airlines will not pick up the tab to protect their passengers.

6. Even if an airport has superior security in the boarding areas, perimeter controls around the runways and maintenance areas are normally non-existent.

Mr. Henry P. Reis-El Bara, a former high level official in the security technology division of the Federal Aviation Administration (FAA) and now a consultant in aviation security and senior vice president ►



A Shi'ite gunman with a bag over his head fires an automatic rifle from the doorway of hijacked TWA Flight 847 at Beirut Airport. (UPI/Bettmann Newsphotos).

of Philips Electronics Instruments Corp., stated in a newspaper interview that "The technology is there. The problem is that as in many other things, the security of airports is oriented more toward crisis management than long term vigilance."

One of the security guards who I interviewed works for one of the largest private security firms in the world. He told me, "They tell us to check for bombs, but we don't even know what they look like. We have never had one minute of training. They just gave me a uniform and told me to stand here (at the passenger gate) and push the luggage through the machine."

One airline security executive told me off the record that the names of suspected terrorists should be circulated to airline check-in personnel so that they can be compared with the names of international ticket-holders (who would have to prove their identities by passport presentation at the time of check-in) but this was not being done "because the airlines did not want to get into the counter-terrorism business."

In researching this article for *American Survival Guide*, I was introduced to a man who is known world wide as a counter-terrorism expert. This gentleman, who must remain unnamed, stated that he and his associates had regularly gone through airport security checks with neutralized revolvers and even dummy hand grenades at over one dozen air terminals. His point was to illustrate the ease with which a terrorist could do in the United States what the terrorists did June 14 in Athens, Greece, with TWA flight 847.

The airports which were the targets of the exercise were Kennedy and Laguardia, Newark (Main and North Terminals), Los Angeles International, Chicago's O'Hare, Toronto, Montreal, and in the State of Florida, Miami, Orlando, St. Petersburg

and Ft. Lauderdale.

After the penetrations were concluded, the security expert contacted both airline and federal security officials responsible for each terminal that had been tested. Shockingly, the corporation executives and special agents were not really interested in the report even after the methods and procedures used were detailed and even in one instance demonstrated.

Advice—For any security specialists who are reading this issue of *ASG*, our brave (if he or any of his associates had been caught it could have meant a \$1,000 fine and even time in jail) expert offers this advice:

Get airport security officers out of their offices and onto their feet. "Each airline must have a roving security specialist, one who tries to get weapons past his own people," to test them.

The "carrot and the stick" approach. Those underpaid screeners should be given a bonus of \$250.00 to \$500.00 every time they catch a weapon going through. And, they should be fined the same amounts every time they let a weapon go through.

In the wake of the incident in Lebanon there was the usual rush to close the barn door after the cow left. There are varied opinions on just what should be done and by whom, at what price to the airlines and governments involved and at what inconvenience to the passengers.

Israel—Checking in for a flight with El Al, the Israeli national airline, always takes twice as long as with other carriers. For that reason, some people prefer not to fly El Al.

For the same reason, a great many more travelers insist on flying El Al, and in many instances will fly nothing else. Those regular customers know that the extra time

they have to spend on pre-flight procedures gives them peace of mind once they are in the air.

On the ground, El Al does not rely on mechanical or electronic scanning devices to examine its passengers' luggage. It trusts only the eyes and the hands of its own highly trained and alert personnel who leave no item unturned in their diligent ferreting through every single piece of baggage to be checked in.

This is the case not only at Ben-Gurion airport near Tel Aviv, El Al's home port, but at every city served by the company.

An El Al check-in examination begins with a series of questions about the traveler, where he last stayed, who packed the bag, and whether he was given any packages or letters.

Then there is a careful scrutiny of passport and ticket. And only then does the meticulous physical examination of the baggage begin.

The procedure is something to see. Every case is opened. Hands burrow into corners. Wrapped packages, even though newly bought, are often opened up. Electrical appliances are made to work (a radio must play and a razor must buzz).

There are also security variations. The ground staff deliberately changes the pattern from passenger to passenger. One man may have his soiled laundry paraded before his fellow passengers, while another may be required to itemize his entire itinerary through his six-week vacation in Europe and to produce bills or receipts to verify a particular detail. It is uncomfortable, often embarrassing, but, there is a special relationship among El Al passengers whether they be Israelis or foreigners, Jews or gentiles, that generally soothes ruffles tempers. The most common remark heard in the long waiting lines

at El Al ticket counters is "It's worth it."

Canada—Canada leaped into a new set of security procedures that was staggering. All air cargo bound for Canada or going overseas will be held for 24 hours for observation.

The Canadian government rushed new security to all major airports and the Canadian airline companies did the same. Trained dogs who can detect explosives are being used to check cargo holds. Other measures include X-ray checks of luggage going into the hold and two checks of hand luggage before passengers may board the aircraft.

Captain Norman Foster, who is president of the Canadian Airline Pilots Association, was very critical of his government for withdrawing special constables of the Royal Canadian Mounted Police at eight regional airports including Victoria, Saskatoon and Quebec City, which do not have overseas flights and replacing them with security guards, backed when required by local police.

UK—In the United Kingdom, the British Aerospace Dynamics group has invented the most effective equipment in the world for cargo surveillance. Using high-energy X-rays and gas spectrographic analysis, the British Aerospace system is controlled by computers from a central-operator terminal. It is capable of scanning a 20-foot cargo container in minutes without unpacking any of the contents. The equipment is presently designed to inspect only cargo, but it could be modified to scan passenger luggage.

Company executives state, "We would propose that for an airport, we would put the luggage on pallets. We could do 40 or 50 suitcases in one and a half minutes."

The equipment and installation costs \$26 million, but 139 countries have inquired and one Middle East country has ordered two. Any purchase contact includes the design and construction of a 1,000-square-yard building which is needed to house the equipment because of the risk of radiation leaks from its powerful X-rays.

Those responsible for security at American airports face a situation that is unequaled any other place in the world. Between 1973 and 1984, checkers and guards detected 31,000 firearms on would-be passengers. This resulted in nearly 13,000 "related arrests." The Federal Aviation Administration reports that in the past 10 years ending December 31, 1984, almost six billion persons were screened at airports in the U.S. More than 7.4 billion carry-on items were inspected. Frequently the security signals sounded and ticket holders were recalled to pass through the familiar gate again, pockets were emptied

and purses re-examined.

The FAA has a special security training program for carriers and holds yearly, recurrent training programs that cover, among other things, the topic of hijacking. The FAA provides a one-hour film on hijacking, but in some cases, airlines make their own films which must be approved by the FAA.

Some pilots and flight attendants say their training is insufficient, that an hour film and a few lectures can't prepare them to deal with a highly organized and highly determined group of terrorists.

"It's an extremely difficult thing to guard against," said one captain that I talked with. "There are thousands of people going through the gates every day, and a hijacker looks like any other passenger. You would almost have to do a security check on every person that boards a plane to even begin to deal with the problem."

One of the difficulties in dealing with terrorists is that over the years they have gained access to the information given at "confidential" training programs for crew members. One airline source said that several flight attendants and pilots have guilelessly revealed details of their anti-hijacking training. "I am sure they didn't mean to cause any harm, but what's covered in our training is supposed to be highly confidential," the source emphasized.

Training—Much of the anti-hijacking training is based on common sense. Goal number 1: At all costs keep the hijackers from entering the cockpit. If the pilots are injured or killed, the chances of handling the plane safely are greatly diminished. But if the terrorists do insist upon entering the cockpit, flight attendants are instructed to place themselves between the hijackers and the pilots.

Ideally, the flight attendants should try and persuade the captors to use them as mediators in all communications with the pilots. This occasionally works in the case of solo hijackings, but a group of terrorists almost always demands an audience with the pilots, as was the case in Lebanon.

During a hijacking, certain code words are used between flight attendants and pilots. These code words are periodically altered, but most sophisticated terrorist organizations keep abreast of the changes. One of the major obstacles in combating international terrorism today is that the terrorists have a superb world wide intelligence network of their own and the democratic nations have yet to organize against it.

Another bit of common sense in dealing with hijackers: Airplanes, of course, are much safer on the ground than in the air.

Continued on page 22



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I was sitting around the other day and realized that while we had offered units with Gary North's and Howard Ruff's names on them, SI has never had a unit that I put my name on. So I decided that I would design a unit and offer it in the next mailer at a special introductory price.

WHAT KIND OF UNIT TO OFFER

Whenever you design a unit, you must first decide what you want it to do. After a lot of thinking, I decided that I wanted a unit that would meet the needs of most families for emergency use. It would offer a good calorie count, but not so high that it would discourage the majority of our customers. I decided on approximately 1500 calories a day. I wanted it to be a full diet unit—that is, more than milk vegetables and grains—including fats, oils and sugar sources. It would also be strong in meat and fruit but still well balanced. It would feature the best combination of air dried and freeze dried dehydrated foods. It had to be easily upgraded for those who wanted a higher calorie count. And finally it had to feature only top quality foods.

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For this newsletter only, I am offering it at the distributor's discount of 60%. You can buy this unit for only \$438.00. That is 75 cans—13 cases of top quality food for less than \$440.00. But then, since I am the president of this company I guess I can offer it at whatever price I want.

So do not miss out—order as many of these units as you want for this low price. But remember, when July 30 comes around this unit will not be offered again at this low distributor's price.

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#C/0565

regular \$ 1095.00 freight collect

Special \$ 438.00 freight collect

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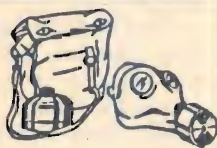
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Israeli Gas Mask Special CBW EFFECTIVE



We decided to put together a package for the highly effective new Israeli Civilian Gas Masks that we have been offering for the past 13 months. We wanted something that was easy to pack and easy to carry. So we have taken a mask which comes with one canister and added a second canister and put them in a heavy-duty used US mask bag. The bag features three small outside pockets that can hold other items such as water tablets, matches, knife, etc. It also has a nice carrying strap that is made so it will not break easily. The bag secures the mask and canisters with two easy-to-open spring snaps.

The Israeli Masks are not only new (meaning they have not been used) but also are of recent manufacture. Made for the Israeli population to protect against gas attacks, they will handle all common battlefield gases including CBW gases. One important feature is that the filter can be changed in seconds without removing the mask. The canisters have no listed limit to shelf life. In talking to those who seem to know, if the protecting seals are not removed they should store indefinitely. Also the filters are readily available at this time. #C/0569

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\$ 29.95 + 3.00 S&H

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- Cooking

Some families in an emergency will not have a stove available for cooking and heating. Also they will need more light than they can get from candles. This kit provides two Aladdin mantle lamps, two extra mantles, one extra wick, one extra chimney, one Kero-Sun Model K kerosene cooker/heater. We also will include tips on using your lamps and stove and how to buy and store your kerosene. #C/0535 reg. \$ 159.00 + 13.00 S&H

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Staff Report



ABOVE & LEFT—The Four Faces Connoisseur Cane's bronze finished head handle makes it an effective club in a defensive situation.

BELOW TWO—The distinctive Colonial Sword Cane has a 25-inch steel blade.



WALKING STICKS AND CANES have long been employed for self-defense, though many used today are not designed with defense in mind.

The Guardian Cane Company of Kansas City, Missouri, sells a large assortment of walking aids, including several made expressly for defense.

The firm, which imports canes and walking sticks from around the world, loaned this magazine four defensive canes for review.

The first item examined was the Four Faces Connoisseur, 36 1/2 inches long from tip to handle. The polished hardwood shank has a gleaming brass ferrule and is topped by a bronze finished head with Four Faces, each showing a different expression. The head becomes the business end of a club should it be necessary to handle the cane in a defensive fashion. It sells for \$42.50 plus handling charges.

Next was the Colonial Sword Cane. This cane is 36 1/4 inches high sheathed. Carved from shisham wood with a stylized lion's head as a top decoration, the top part of the cane becomes the 5 3/4-inch handle of a sword with a 25-inch steel blade when separated from the carved wooden and brass-tipped shank. The Colonial Sword Cane sells for \$24.95 plus handling.

The Steel Porcupine appears to be a handsome 36-inch hardwood and metal cane. But just pull down on the collar of the silver plated pommel handle and presto—out snap six 1 5/8-inch spring activated steel spikes like a medieval mace. The spikes fold back into the handle and a push up on the collar holds them in place. Once again this formidable weapon offers no hint of its presence. The Steel Porcupine is \$163 plus handling.

In France, the Beau Geste Dagger Cane is also known as the Door Knocker. The knob on top will make a powerful rap on a door, or a noggin should the need arise. And if you're still in trouble, a quick tug on the handle unsheaths an 11-inch dagger fashioned from a legionaire bayonet. The handle, in the shape of a small slender grasping hand, is finished in silver, which complements the black steel dagger and dark brown shaft of the cane. The price is \$140 plus handling.

Guardian Cane Company offers canes from around the world and the United States including various gadget canes and "secrecy sticks," hiking staffs, umbrellas and self-defense products. For more information or a copy of their catalog, write Guardian Cane Company, Caller Box 310, Kansas City, MO 64141. ●



ABOVE & LEFT—A heavy handle on the Steel Porcupine becomes a medieval mace by slipping a protective collar downward.



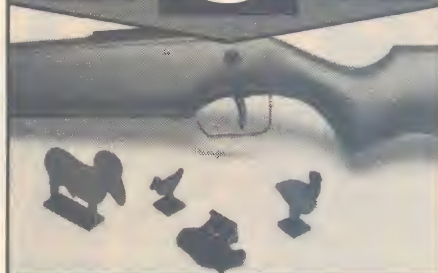
ABOVE & LEFT—Beau Geste Dagger Cane also serves as a door/head knocker.

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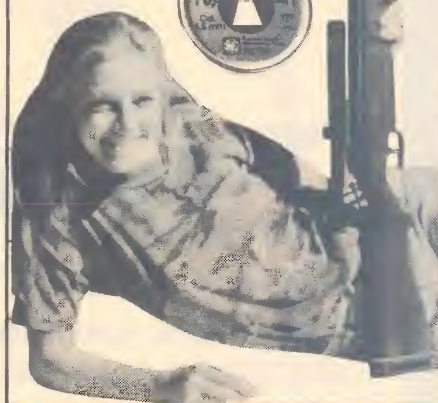
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Fundamentalist Shi'ite Moslem demonstrators burn an American flag on the tarmac at Beirut Airport during the TWA hijacking incident. (UPI/Bettmann Newsphotos).

Continued from page 17

This is particularly true when the terrorists have automatic weapons and bombs on board the plane.

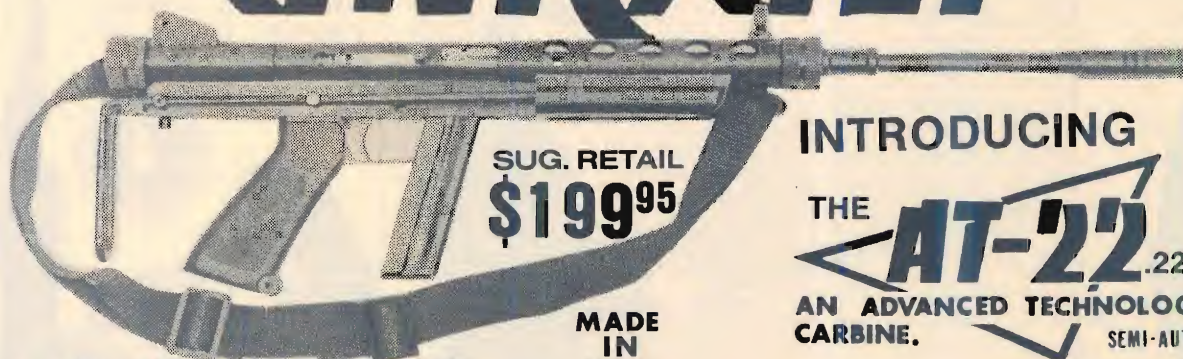
"If the plane is hijacked while the plane is on the ground, the major goal is to keep it right there," one airline security expert told me. "We teach our people to create as many mythical mechanical problems as possible—anything to keep the plane right where it is, because once you take off, the danger factor increases tremendously."

When dealing with a solo hijacker, flight attendants are taught to take on the role of a mother to their captor. "You try and serve these individuals and try to strike up a conversation with them," the security man said. Other dialogue between captors and crew includes stressing that the terrorists should not harm the passengers—letting them know that they would face severe repercussions if anyone on the plane was injured.

Flight attendants also are instructed to serve the hijackers massive doses of liquids with the hope that a weak-bladdered hijacker will make an inordinate number of trips to the bathroom, affording the flight attendant the opportunity for a few unmonitored moments with the pilots. But when dealing with a sophisticated group of

Continued on page 50

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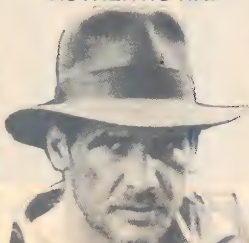
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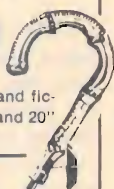
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By Jerry Younklns



EMT students prepare to place a patient with suspected spinal injuries into an ambulance.



A student practices CPR on "Annie," a training dummy.

THE MOST VALUABLE skills for the survivalist are those that serve both in everyday use and as they would if called upon in some future emergency. Hunting, gardening and repair skills come immediately to mind but perhaps none is more likely to find life saving application today or down the road than the one that deals with emergency medical treatment of the sick or injured.

To gain proficiency in such emergency treatment the survival-minded individual might consider the course of study open for the emergency medical technician (EMT). This is a readily available, practical and intense study where students balance bookwork and lectures with the hands-on practice of state-of-the-art, life-saving techniques. The study culminates with participation in real ambulance runs with working EMTs or paramedics. Interested readers will find courses available through local institutes of higher learning, Red Cross or other public service organizations and fire or emergency rescue departments in the local community. Quite often fire or rescue departments that are manned by volunteers will provide free schooling for those who are interested in volunteer duty. This is an excellent way for the survivalist to both receive instruction and to return service to his or her local community. The EMT-trained individual will, over the course of time have a chance to provide aid in various real-life emergencies.

Take Note—Before discussing the areas of knowledge accompanying EMT training there are a few points that should be

noted. First, neither the study nor practice of EMT skills are for the squeamish. For the most part, this will not deter serious individuals but you should be ready. You should also know that EMT training is not for the "armchair" survivalist as it requires study and time, but I can personally guarantee that the rewards more than equal the effort. Considering the scenarios that many of us anticipate in the future, the acquisition of these skills is invaluable. You will also find that your training literature will be a cornerstone of your survival library.

The training can also lead to survival-related employment as positions available for trained EMTs are readily available in many locations. The EMT position is also a stepping stone to the higher paying and advanced knowledge position of paramedic.

Looking from the survivalist perspective EMT skills are first priority knowledge for their strength is immediate treatment of injury or illness and stabilization of the patient. In a medical emergency it is often those first few seconds or minutes that decide the outcome.

Schooling—Instruction begins with an overview of EMT responsibilities and capabilities and an introduction to the laws that govern the performance of the EMT. Then begins the most basic medical study, learning human anatomy. This area is critical for both the evaluation of the patient and in order to communicate with the hospital emergency room staff (with whom the EMT will develop a close work-

ing relationship) via radio either enroute or at the accident scene. Anatomy study involves memorization and detail but is a basic skill and includes the skeleton, internal organs and location of major blood vessels.

CPR—While the order of study may not follow precisely my listing, it will entail the following: Patient assessment, respiratory or cardiovascular systems and injury thereof by location (chest injury) or type (control of bleeding or shock). Early in the training, the technique for cardiopulmonary resuscitation (CPR) will be discussed and practiced. This technique should be mastered by every man, woman and older child in the U.S. and has already been responsible for the saving of untold victims of drowning, heart attack and other injuries. The students will spend a great deal of time getting acquainted with "Annie," no comic strip character but rather the name of the realistic CPR practice mannequin.

Closed Air Passages—In close conjunction with this technique will come the knowledge of how to open and maintain an unobstructed airway and EMT techniques are learned that are specific for adults, children and infants. For instance, CPR for an infant requires a much lighter breath stroke and careful protection to avoid damage to the neck. The student will discover tremendous but absolutely necessary attention to detail.

Shock—The treatment of shock



LEFT—EMT- and rescue-trained firemen display their equipment.

RIGHT—An injured victim is removed from simulated accident wreckage by EMT students.



LEFT—An injured patient on a stretcher board is placed in an ambulance.

RIGHT—Using sophisticated extrication equipment, firemen remove the roof of a pickup.



(defined as collapse of the cardiovascular system) is another subject discussed in detail as to cause, type and treatment. Shock is the deadly companion of illness and injury and is induced by inadequate flow of blood. An appreciation of its significance is seen in the fact that the brain cannot lose circulation for longer than four to six minutes without permanent damage.

Oxygen—Once the techniques for basic life support, the ABCs (Airway, Breathing and Circulation), are mastered the student will learn how to use artificial ventilation equipment and oxygen. This includes the insertion of oropharyngeal airways (plastic breathing aids that may only be used on the unconscious patient), pocket masks, bag valve masks and others. I fondly remember my first experience with a bag-valve mask system. The particular unit had been used by a procession of students and had become loose and kept coming apart while I was attempting to obtain an air tight seal on the practice mannequin. While this was humorous in the classroom it drove home a very important point, the need to know your equipment and its maintenance.

This is a sore point among a number of the survivalist medical people that I know. They advise against purchase of any medical equipment that the owner does not know how to use. I've heard some wildly funny although deadly sarcastic stories about novice survival medical "experts" operating by candlelight with their emergency field surgery kits while consulting

the NATO Emergency War Surgery text (not for the novice).

More Topics—Other subjects will include the ability to perform an IPS, initial patient survey, where within two minutes the student must do a head-to-toe examination of the patient. This is particularly significant in real life where the patient will often be unconscious. As little movement of the patient as possible is critical and yet the EMT must be thorough. In class practice the student performing the IPS had to locate a penny hidden on the victim, needless to say this could lead to some amusing incidents.

Emergency childbirth, recognition of diabetic coma or insulin shock, evisceration, eye injury, spinal damage, epilepsy, pediatric emergencies, heat and cold exposure, poisoning, and drowning are all covered, as are exposure to hazardous materials, radiation, and electrical shock.

Spinal Injuries—An area that involved the entire class in participation was that of applying dressings, bandages, various types of splints and boarding of patients with suspected neck or spinal injuries. When you first begin to attempt these skills it instills a tremendous respect for the men and women who are deft professionals working in often severe weather conditions and under pressure.

Extrication—After introduction and practice of these basic skills the students are introduced to the ambulance or emergency vehicle and its handling and main-

tenance. An extrication workshop is also attended where an amazing assortment of prying, cutting and lock-breaking equipment is demonstrated on some unfortunate remnant of Detroit's better days. Often the EMT will arrive on the scene of a vehicular accident only to find patient or patients pinned into the twisted wreckage and it is not uncommon to remove doors, roof and steering column to extricate a victim.

Exam—As if the above subject is not enough to master, the students who wish to become state certified must pass a rigid exam with both written and practical areas. While these tests may seem traumatic they are mild to performance at a real life emergency. Some samples of the practical aspect: finding a non-breathing baby in a crib and evaluating and applying treatment; and encountering an unconscious adult male who has fallen from some height to a concrete floor.

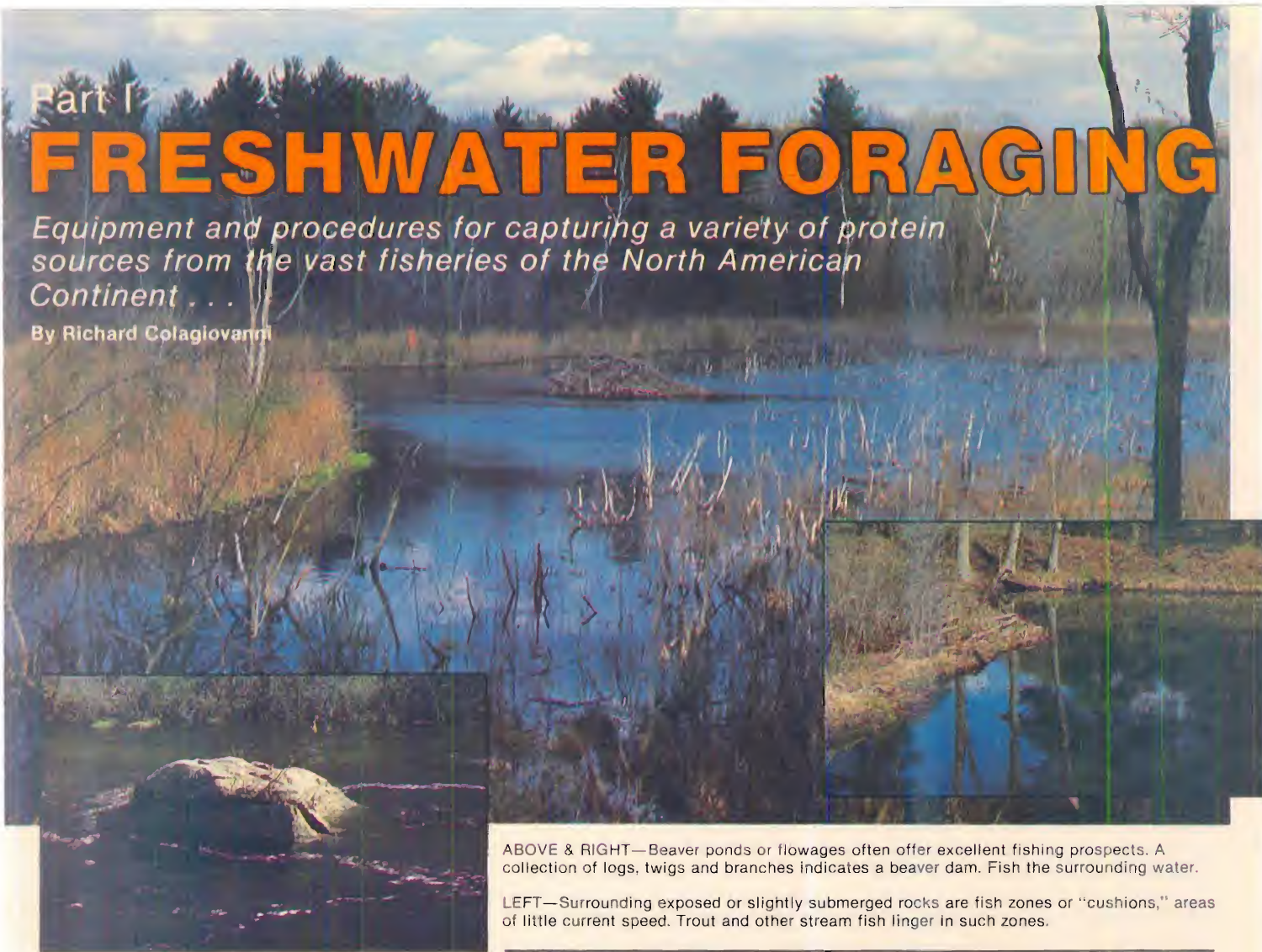
Real Situations—At some point during training the student will begin to ride an ambulance with professional EMTs. This exposure to real situations is what drives home the value of the training. A close friend treated an unconscious patient with CPR while the EMTs worked feverishly to manage six bullet wounds. Everyone I know who has completed this study will attest to its inestimable value, and the knowledge that you gather here may someday save the life of a loved one or a member of your survival group. EMT training should be at the top of your list for skills to acquire. ●

Part I

FRESHWATER FORAGING

Equipment and procedures for capturing a variety of protein sources from the vast fisheries of the North American Continent . . .

By Richard Colagiovanni



ABOVE & RIGHT—Beaver ponds or flowages often offer excellent fishing prospects. A collection of logs, twigs and branches indicates a beaver dam. Fish the surrounding water.

LEFT—Surrounding exposed or slightly submerged rocks are fish zones or “cushions,” areas of little current speed. Trout and other stream fish linger in such zones.

(This is the first of a multi-part series of articles dealing with the equipment and methods employed to catch numerous fish species in their freshwater habitats. This article, after presenting an overview of the condition of America's fisheries, explains freshwater fishing “systems,” some basic gear and live baits. —The editors.)

CENTURIES AGO, the initial explorers of North America viewed and reported vast freshwater fisheries resources along the Atlantic, Gulf and Pacific coasts. Early New Englanders disclosed numerous anadromous runs of Atlantic salmon, shad, sea-run trout, along with interior populations of char, landlocked salmon, lake trout, pickerel, etc. Encountered along the Gulf, as the voyageurs proceeded inland, were giant bass in Florida, and catfish exceeding 100 pounds in weight inhabiting the Mississippi Delta. The West Coast was not unnoticed. Vast runs of sea-run trout, salmon and sturgeon of enormous proportions swelled in the streams connecting to the sea. Interior mountain streams and lakes brimmed with indigenous trout, char and other fish. The resource was vast, the waters coast-to-coast pristine and unadulterated.

As the white man penetrated the interior

in search of furs, “manifest destiny” and so forth, he discovered lake chains and mammoth (Great Lakes) waters, interior “seas” abounding with trout, walleye and other highly desirable fish.

Prior and during this age of discovery, many coastal and interior indian tribes engaged in fish harvesting activities varying from “casual” capture by hand or thrown objects (rocks, logs) to more advanced and dependable spears, bows and arrows. Several indian cultures in coastal zones and large interior lake regions developed highly organized commercial “fish factories” that relied on elaborate netting and trapping systems, resulting in fresh and dried fish sustenance available for year-round consumption.

The white man too, learned to harvest the bounties of the “sweet water” streams and lakes but in many instances, his sheer numbers and more advanced harvesting technology captured the fish at a greater rate than their natural replacement. Greed over-shadowed logic. Salmon, trout, sturgeon, catfish, etc., harvested in excess, were disposed of as fertilizer and feed for crops and livestock. One colonial era report mentioned barrels and hogsheads, filled with salmon and trout, left to spoil as shipping methods lagged well behind fish

production. Another account stipulated that employers of servants could not serve salmon in excess of three times per week to their hired help.

Man's Impact—These unspoiled resources finally “felt” the impact of man. Man's use of the land and water, in many instances, began to alter fish habitat. Deforestation for agricultural use, a necessary activity of the spread of civilization, produced pronounced ecological change. Cold temperature streams that flowed at predictable volumes and “quality,” now either dried up in late summer, or their water temperature exceeded that for trout survival. The cooling overstory of trees that helped control both water temperature and volume had been replaced by farms and towns. Vast grasslands of the plains, tilled by “sod busters,” created a vast grain belt. However, fish frequenting this region experienced increased turbidity and reduced summer/fall flows with unchecked floods of spring, all resulting in changes in fish types (species) and numbers. Many cold water types were displaced by the more durable (not necessarily desirable) “rough” fish of warm water origin (with their inherent toleration of more severe environmental factors).



A dam provides for water aeration and near the waterfall is good fishing, especially in late summer and early fall.



This is some of the basic freshwater fishing gear used.



A nice brook trout is destined for the frying pan.



This angler has a metal clip chain stringer. The chain is attached to a stream or river bank and the fish are submerged to keep them fresh.

Other factors reduced fish populations further. Dams prevented migrations and regional movements, as well as drowning out needed spawning and feed locales, pollution in a diversity of types: oxygen-demanding wastes originating from municipal sources, livestock and factory operations and toxic elements, the by products of technological advancements. These are substances that kill many forms of aquatic life outright, or weaken and mutilate existing life (fish) to the point of being susceptible to naturally occurring diseases or even worse, total genetic mutation resulting in limited to zero reproduction. Or in other cases, fish populations that visually appear healthy are lethal "time bombs" laced with chemicals. Once these are ingested by man, they accumulate throughout his body.

Improvement—*However, all is not grim.* The art and science of fish management, sponsored by knowledgeable fishery personnel, in conjunction with waste treatment experts have changed in most instances this course of destruction, resulting in many positive gains. Water quality, for the most part, has been improving. Treatment for waste at all levels of production have been initiated and implemented.

Numerous large impoundments devised for water storage, navigation, flood control, and power generation have created thousands of square miles of new fish habitat (i.e., Tennessee Valley Authority, Lake Mead). Literally millions of "farm ponds," created by dams and excavations and existing coast-to-coast, provide fish production sites. Original cold water stream watersheds have been reforested. Suitable high production fish habitats now exist once again. Federal, state, local and private organizations maintain and produce billions of fish from highly sophisticated hatchery systems.

Introduced species, such as the "German" brown trout, filled, in many instances, these newly created biological slots created by land/water alteration. Land use modified the cold water brook trout streams. The brookies lost out. The slightly elevated temperature and turbid waters now provide excellent habitat to the browns. On the other side of the coin, eastern brookies, through stocking, now frequent in sizeable numbers, their new homes in the western mountains. Large-mouth bass of central drainages are now available coast-to-coast. Some introduced species, such as the German carp, have adjusted too well, crowding out more

desirable species, or have taken up the slot created by the demise of a less tolerable species (i.e., trout, etc.). One of the current "success stories" of note, is the "rebirth" of the Great Lakes fishery, a massive project that included control of parasitic lampreys that enter the "land-locked" Great Lakes via the St. Lawrence Seaway, pollution abatement from municipal/commercial sources, stocking of forage fish for salmon and trout, and reintroduction of the "sharing" warm water fish: the walleye, perch and bass.

The Future—It appears that massive destruction of fish habitat has been halted or reduced, in most cases. However land development, especially in the form of wetland drainage, is a crucial area of concern. Arid and semi-arid regions, are still effected by irrigation operations which even though essential for agricultural production of food stuffs, produce lower (lowering) water tables and increased salinity and temperatures, along with reduced stream flows (e.g., San Joaquin River, Calif.). On the other extreme, with the creation of dams on large rivers that originate in snow covered mountains, nearly year round stable flows have been created, thus vastly

Continued on page 60

Awareness:

EXPLOSION

*Recognize the lethal potential,
then prepare accordingly . . .*

By Jim Benson



Firefighters battle the aftermath of an oil refinery explosion. Refineries are frequent sites of explosions and accompanying fires. (Photo by John Bryson/The Image Bank)



This scene shows the aftermath of an explosion and large fire (Photo by Jim De Lillo).

EXPLOSIONS HAVE ripped apart people and property since gun powder was first used in China some 850 years ago. Though the primary purpose of explosives for centuries was as weapons of war, their peacetime potential was eventually realized. Today explosives are vital to civilian industry and technology—as well as in the military.

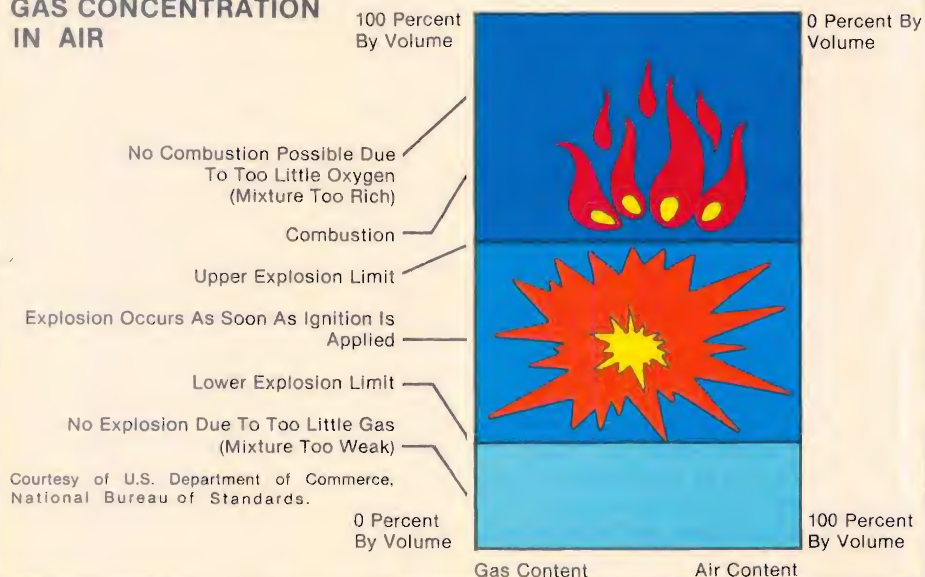
Modern society cannot exist without explosives, but the injuries, death and destruction they cause are evident to anyone who reads news reports.

Many of these diverse explosion dangers do not result from the intentional use of explosives, but rather from the unintentional ignition of explosive substances.

Here are a few examples of explosions that have occurred recently:

- A gas plant explosion in a suburb of Mexico City kills 452 people and many more are injured and homeless.
- At least 508 people, but probably more than 700, including 300 children, perish in the Brazilian shantytown of Cubatao when a leaking gasoline pipeline explodes.
- A huge and mysterious blast at the Soviet naval supply depot at Severomorsk reportedly wipes out more than 200 people and destroys large stocks of ammunition.
- An explosion apparently caused by methane gas in a coal mine in Commodore, Pennsylvania, injures 10 miners. Three others are missing and presumed dead.
- Airborne flour dust ignites at a milling company in Clifton, New Jersey, injuring three workers and blowing out walls at the plant.
- An explosion rocks an oil refinery in Romeoville, Illinois, killing 17 people, injuring 23 others and knocking out electrical power to 10,000 homes. Windows are shattered for miles around. Fire rages out of control at the refinery.
- The explosion of an ammonia tank in the refrigeration system at a meat packing

GAS CONCENTRATION IN AIR



plant in Vernon, California, unleashes a huge ammonia cloud, injuring 60 people and driving dozens of employees into the streets for fresh air.

- A Los Angeles, California, firefighter dies from smoke inhalation when his air supply runs out in a burning restaurant following a "back-draft" explosion of smoke particles.

Bombings and Disasters—Additionally, scores of people are killed, hundreds are injured and tens of millions in property damage result annually from bombings and other explosives incidents reported to the Bureau of Alcohol, Tobacco and Firearms (BATF). In the most recent year for which statistics are available 803 bombing incidents were reported.

There have also been numerous large-scale explosion disasters in the U.S.:

- A ship with a cargo of ammonium nitrate fertilizer catches fire and explodes while docked in Texas City, Texas, on April 16, 1947. This and subsequent explosions and fires, kill 561 people.

- Another ship explosion at Port Chicago, California, on July 18, 1944, kills 322 people.

- A New London, Texas, school explosion on March 18, 1937, kills 294.

- A munitions plant explosion in Eddystone, Pennsylvania, on April 10, 1917, kills 133.

- Another 130 people die in a Cleveland, Ohio, gas tank explosion on Oct. 20, 1944.

- And a coal mine explosion in Monongah, West Virginia, on Dec. 6, 1907, kills 361.

These are some of the most lethal explosion disasters in this century in the U.S.

It could be impossible to protect oneself and family against *all* explosion dangers, many of which are not recognized until it is too late. But for survivalists, a fundamental knowledge of explosives and some of the hazards they represent can aid in efforts to secure a measure of protection.

History—In addition to their many applications in warfare, explosives are employed in agriculture, road building and other construction, and in mining and manufacturing, to cite just a few peaceful uses. Pyrotechnics, or fireworks, is one of the major recreational uses of explosives. Today, science is discovering important uses for explosives in space technology.

The origin of gunpowder (black powder), the first true explosive, is obscure, but the Chinese probably were aware of the properties of saltpeter (potassium nitrate), one of the constituents of gunpowder, as early as 207 B.C., though its use was not developed beyond fireworks until about 1150 A.D.

Knowledge of the effects of gunpowder soon spread to the Arab world and

Europe. The first recorded western experimenter to establish the formula for gunpowder was an English monk named Roger Bacon, a scholar, mathematician and scientist.

Its first use as a propellant in Europe occurred about 1320. The Arabs may have used gunpowder about the same time. English troops used cannon against the French in 1346.

The formula for gunpowder has changed since, but its basic constituents—potassium nitrate, carbon and sulfur—have not. It is now used only as a propellant in replica firearms by shooters who enjoy weaponry of times past. It burns very quickly, about 400 meters per second. Its residue fouls rifle and pistol bores, and fosters destructive corrosion.

On the other hand, it burns too slowly to produce the shattering effect of modern "high" explosives. Dangers associated with uses of black powder will be discussed farther along in this article.

Modern Explosives—Scientists and inventors tinkered with other forms of explosives for centuries, leading to some notable developments in the field, but it was not until the 1800s when the Swede, Emmanuel Nobel, and his sons, most importantly Alfred, began successful commercial production of more powerful explosives.

Expanding on the ideas of other inventors, the family started to produce "Nobel's blasting oil," a version of the highly volatile glyceryl trinitrate.

This substance proved highly unstable, however. A tragic accident occurred in 1864 in which the Nobel works blew up, killing one of Alfred Nobel's brothers and maiming his father. Alfred developed a more stable, yet powerful, explosive which he called *dynamite*, after the Greek word for power, and saw it enter world markets in 1867. Dynamite revolutionized industry

and led to development of other types of high explosives and "smokeless" gunpowders.

Explosion Physics—Perhaps Alfred Nobel's greatest contribution to chemistry was his discovery that the shock-spreading wave of a high explosive *detonation* is significantly different from the flame-spreading of ordinary black powder.

When a black powder explosive is set off, it undergoes rapid decomposition and releases large quantities of gas and heat. The explosion is a fast combustion or burning, the burning spreading layer by layer through the material exploded at a comparatively slow velocity of up to 400 meters (1,312 feet) per second. Although its rate increases with increasing pressure, the burning can be controlled. This reaction is often called *deflagration*.

The term *deflagration* is used to describe the burning of so-called *low* explosives such as black powder. In the far more powerful *high* explosives, the burning reaction is referred to as a *detonation*. It is an extremely rapid burning which produces a supersonic (faster than 741 mph) shock, or detonating wave, in an explosive material.

The detonation velocity is a characteristic of the explosive substance itself and is unchanged by changes in pressure. It is usually between 2,000 and 9,000 meters (6,500 and 29,500 feet) per second. The detonation wave produces very high pressure, about 650 tons per square inch, and this exerts a severe shattering effect on anything in its path. The gases formed travel in the same direction as the detonating wave, so a low-pressure region is created behind it. Once the detonation has been started it cannot be stopped.

The fundamental properties of explosives are the velocity of burning or detona-

Continued on page 45

PROPERTIES OF SELECTED FLAMMABLE LIQUIDS AND GASES

Name	Flashpoint (Degrees F.)	Explosive Limits (Percent by Vol.)		Ignition Temperature (Degrees F.)	Vapor Density (Air = 1)
		Lower	Upper		
Acetone	0	2.6	13.0	869	2.0
Acetylene	Gas	2.5	100.0	581	0.9
Ammonia	Gas	15.0	28.0	1,204	0.6
Benzene	12	1.3	7.1	1,040	2.8
Butane (nor)	Gas	1.8	8.4	761	2.1
Butane (iso)	Gas	1.8	8.4	860	2.1
Carbon Monoxide	Gas	12.5	74.0	1,204	0.97
Denatured Alcohol-95%	60	—	—	750	1.6
Ether	- 49	1.9	36.0	320	2.6
Ethyl Alcohol	55	3.5	19.0	689	1.6
Gasoline (auto)	- 50	1.3-1.4	6.0-7.6	700	3.0-4.0
Hydrogen Sulfide	Gas	4.3	45.0	500	1.2
Isopropyl Alcohol	53	2.5	12.0	750	2.1
Methane	Gas	5.0	15.0	1,004	0.6
Methyl Alcohol	54	6.7	36.0	725	1.1
Naptha, VM&P	20-45	0.9	6.0	450-500	3.8
Petroleum Ether					
(Benzine)	0	1.1	5.9	550	2.5
Propane	Gas	2.1	9.5	842	1.6
Vinyl Chloride	Gas	3.6	33.0	882	2.2

Courtesy of U.S. Department of Commerce, National Bureau of Standards

Trail Test:

ROCKY BOOTS

These lightweight, composite construction Eliminators, pass the toughness evaluation . . .

By Dave Epperson
Senior Field Editor
Copyright, 1985



ABOVE—Here are the brand new Rocky Boots Eliminators before the walking evaluation.

RIGHT—This photo shows scuffs and wear after eight weeks use.



CORE RESOURCE, the survival supplier, asked "How would you people like to test a pair of Rocky Boots?"

American Survival Guide crewmen, cognizant of hot sweaty feet and blisters, were reluctant at first, and asked: "Who wants to break in a pair of new boots?"

This field editor was elected to do the trail testing, and Core in time dispatched a pair of Rocky Boots Eliminators, size 12D, for evaluation. This field editor removed his customary office running shoes, pulled on the lustrous black nylon and leather Eliminators, and the testing began at once.

Construction—The Rocky Boots Eliminator features a ribbed Vibram sole; leather toe, side and spine panels; Cordura nylon uppers; a fiberglass shank; a Gore-Tex inner liner; a washable Orthotic insole; and Thinsulate fiber insulation.

The Vibram sole is the semi-spongy variety, not the heavily cleated "Mon-

tana." This sole offers effective tractive grip on the majority of walking surfaces. The Cordura uppers are eminently scuff resistant, as is testified to by use of the fabric in military and police web gear. The fiberglass shank provides controlled flexibility and contributes to overall light weight of the boots. The Gore-Tex inner panels provide one-way breathing; moisture is expired through the fabric, but water cannot enter. The insole material offers additional cushioning, and can be removed and laundered repeatedly, a welcome hedge against fungus foot infections. The 3M Thinsulate liner is composed of fibers that trap air and provide protection against cold.

All together, these materials melded into the composite structure, result in a boot that weighs but 38 ounces the pair.

Wear—At first, the Eliminators were worn through a couple of weeks of city work—swivel chair sitting, pickup truck

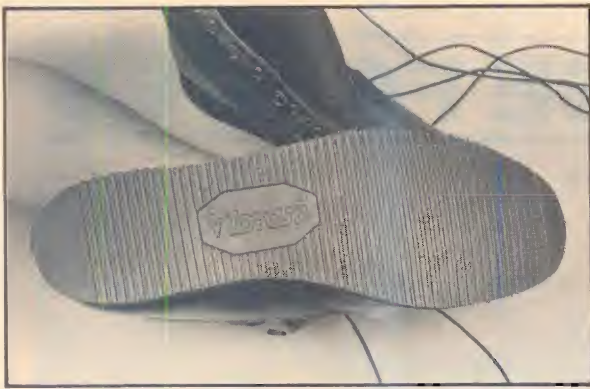
driving, supermarket shopping and the like. Then the boots went on magazine assignment to the outback where they were worked over desert sand, drywash gravel and mountain granite. And then the *true* test was initiated.

The Rocky Boots were footgear of the day for concrete work, electrical repairs, natural gas pipe fitting, and major plumbing. Moreover, the boots were walked as much as 18 miles per day over surfaces that ranged from soft forest floor of pine needles to sharp decomposed granite and abrasive sandstone.

The Eliminators were treated to some swamp water, muck and mud, and rainy day puddles.

At the end of eight weeks, the boots did show some wear. The leather panels, as the accompanying "After" photo shows, displayed evidence of severe scuffing.

The Vibram soles, when new, present a groove depth between sole ribs of approximately 2.5mm. At the conclusion of the



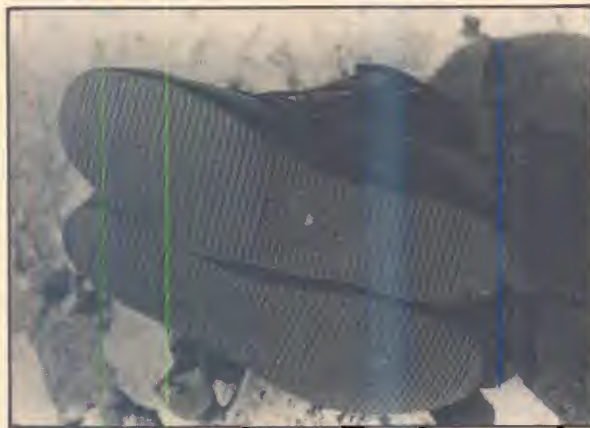
LEFT—Vibram ribbed soles proved effective in rock climbing, but wore quite rapidly.

RIGHT—Leather toe and side panels are stitched to Cordura uppers with double seam.



LEFT—Gore-Tex liner permits flow of moisture out of the boots, but doesn't admit water.

RIGHT—Lacing ring eyelets are riveted through Cordura side panel, and through backing tape.



LEFT & RIGHT—The lower parts of the Rocky Boots Eliminators are shown at the end of the rough testing period.



test period, the soles had worn to 0.5mm groove depth in the most used ball-of-the-foot area. This means that four-fifths of the tractive rib had been abraded away in the rough going in less than 60 days use.

The Cordura uppers, after being hosed off thoroughly, showed no signs of wear whatsoever, and likewise the Gore-Tex and Thinsulate components. Washing the Orthotic insole restored it to its former nonodorous condition.

Fit—The Eliminator boot is built with four punched-in eyes at the bottom of the lacing, and five pairs of riveted-on ring eyelets to the top. The boot's Cordura tongue is 6.5 inches wide, and the Cordura upper side panels are quite broad, making the Eliminators easy to pull on and lace up. However, those with skinny ankles will find that the two side panels can be drawn completely together by the laces, leaving a somewhat loose fit and some absence of ankle support. People with large diameter

ankles, will not encounter this problem.

The agony of break-in was anticipated, but failed to emerge while wearing the Rocky Boots. There were no blisters, not even a hiker's "hotspot," to plague the Eliminators tester.

Evaluation—From an outdoorsman's point of view, the Rocky Boots Eliminator is a fit boot for hard work and/or hunting and fishing. From a long-term survival standpoint, the single weak point lies in that semi-soft Vibram sole—cushiony for comfortable walking, but prone to wear in hardrock going. Here one must exchange longevity for excellent, sure-footed grip in the rough stuff.

Prices and Places—Rocky Boots' all-black Eliminators are available by mail in sizes 7 through 13, and in half-sizes to 10½, in standard D width, and in extra-wide EE, from Core Resource, 2066 Old Middlefield Way, Dept. ASG, Mountain

View, CA 94043; phone (415) 961-3763.

The Eliminators' regular price is \$109.95 per pair, plus \$10 for shipping. However, Core is offering a special price of \$99.95, plus a \$5 shipping charge, on the Rocky Boots.

Rocky Boots, the maker of Eliminators, offers a full reconditioning service for worn boots. Priced at \$24.99, plus \$3.50 for shipping and handling, the service includes resoling, restitching, redyeing, regluing, repair of the midsole, new laces and sanitizing. The reconditioning offer is included with each new pair of Rocky Boots.

The Other—As compared with this editor's Browning Featherweight field boots with the identical Vibram sole, this field tester, on a scale of 1 to 10, would rate the Eliminator and the Featherweight at a 9. This rating includes break-in, overall durability, price and, above all, comfort. Nothing's perfect. ●

True Militias:

CITIZEN DEFENSE FORCES

These are military forces made up of civilians who come together in times of emergency . . .

By Michael Pietrantonio



State defense force missions include providing security for high priority targets, such as this nuclear generating station at Indian Point, New York.



The Florida National Guard was called out to help restore order after rioting in Miami in 1980. If the guard were unavailable because of mobilization for service elsewhere, who would take over for them?

A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.

Article 7, Amendment 2

The Constitution Of The United States

THIS ARTICLE of the U.S. Constitution is often cited by those in opposition to gun control efforts—and rightly so. But the article does more than establish the citizen's right to "keep and bear arms." The article cites, indeed demands, the establishment of a "Militia" as a prerequisite to the maintenance and existence of a "free State." Does such a militia exist currently in the U.S.? If not, should it?

Initially the answer to the first question seems obvious. The National Guard certainly seems to meet the requirements of a militia. It is a military force, made up of civilians who come together in times of emergency to provide the services required during those times. They are normally under state jurisdiction, and are frequently used to supplement the normal state forces such as police, prison security, search and rescue, etc. Superficially, the National Guard appears to satisfy the requirements for a militia as spoken of in Article 7. Upon deeper examination however, problems in the National Guard's role of militia begin to appear.

The "total force" concept, adopted in recent years by the U.S. military establishment, has undermined, and possibly destroyed the militia role of the National Guard.

"Total force" planning, mainly a result of fiscal considerations, now requires the National Guard and reserves to provide substantial percentages of the first battle forces of the active Army. One-third of the 24 U.S. combat divisions, and more than

half of the U.S. Army infantry and field artillery battalions will come from reserve and guard units. The military will be unable to fulfill its wartime mission without the integration of reserve and National Guard units into its tactical field formations.

The States—A national emergency severe enough to prompt the federal activation of guard and reserve units will also likely require the individual states to implement emergency plans of their own. For example, the dispatch of troops to Europe during an escalating crisis will, it can be assumed, generate demonstrations and a very real physical threat to vital state and federal installations. If the emergency is severe enough that the guard and reserves were federalized for overseas duties, then in addition to the threat of domestic protests it is also likely that a very real and dangerous threat will come from foreign directed sabotage and disruption efforts. State agencies deprived of the use of their National Guards will be unable to cope with this threat.

There is thus a large security gap which needs to be addressed by the individual states and the federal government before a crisis arises.

True Militias—Until federalized, and while under state control, the various National Guards are indeed militias. Once federalized, however, that role is lost. A number of states have recognized the problem and have created or are considering creating state guards or state defense forces.

These units are true militias. Under current laws they are not subject to federal activation. Members of these units may

not, by law, be members of other organizations which are subject to federal call-up. On the converse side, since these units are not subject to federal authority, they can not receive any federal funding or training. The states themselves must equip and train these units independently. This is the primary reason why two-thirds of the states do not have any sort of state defense force, and those that do, have state defense forces which are numerically inadequate to do the job they may be called upon to do.

Also of concern within those states which do have state defense forces, is the bureaucratic infighting to which the state defense forces are subject. National Guard commanders are reluctant to endorse a program over which they have little control. State defense forces face a constant struggle to simply maintain their existence.

A recent case illustrates this point. The 105th Military Police Battalion of the Texas State Guard was more than once called the "finest battalion" of the 31 which compose the Texas State Guard. These words of praise came from military and other observers. The men in the unit purchased their own vehicles and BDU cammies. Realistic riot control and other training was undertaken by the unit itself on its own initiative. This was too much for the powers that be within the Texas State Guard. Cited as being over eager and excessively military in their approach, the commanding officer of the 105th was bounced and the unit ordered broken up. The men of the 105th have thus far refused to be bullied. On their own time they continue to train and increase their readiness for operations and scenarios they see as likely. This unit represents in the truest sense, the modern day American militia. The obstacles placed in the way of the

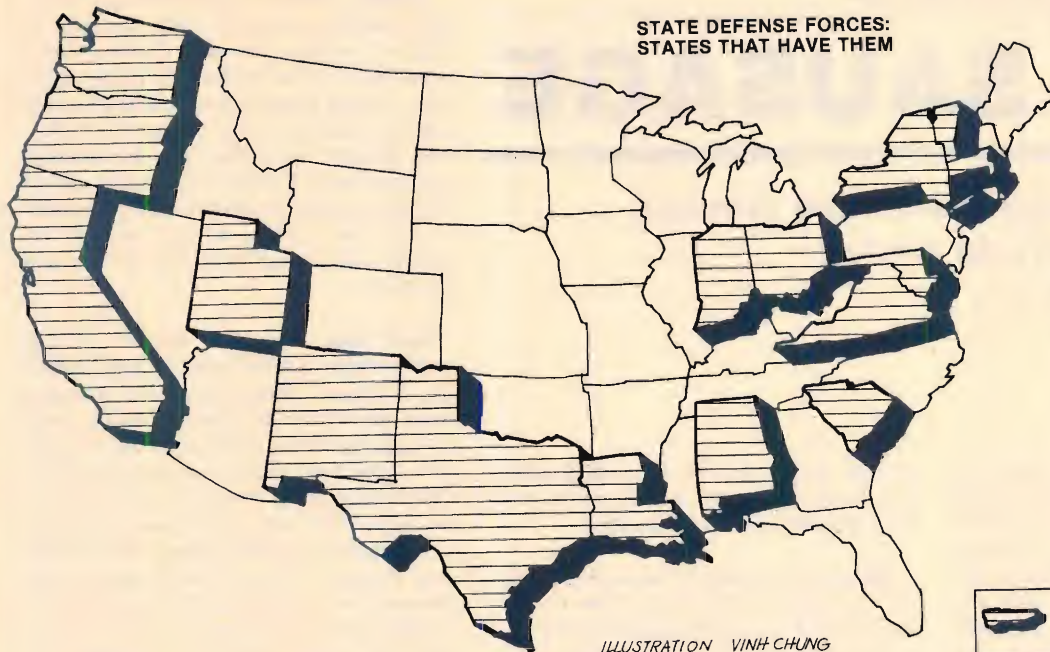


ILLUSTRATION VINH CHUNG

Alabama
California
Indiana
Louisiana
Maryland
Massachusetts
New Mexico
New York
Ohio
Oregon
South Carolina
Texas
Utah
Vermont
Virginia
Washington
Puerto Rico (terr.)

105th illustrate the attitudes which must be overcome before an effective network of state defense forces can be created. Even among those states which do have state defense forces, those forces are typically regarded as little better than "rent-a-cop" or guards. In a situation in which state defense forces are called upon to replace the National Guard, the current attitudes toward state defense forces and their training will spell disaster.

Missions—Perhaps the most controversial aspect concerning state defense forces is the definition of the role and missions of those forces. Should the state defense forces attempt to duplicate the National Guard's combat ability, or should they assume only the police and emergency service functions of the Guard?

In the situations in which a state defense force is likely to be called upon, the distinction between a "combat" mission and a constabulary mission is likely to be somewhat blurred. The scenes of Miami during the 1980 riots illustrate this point. The Florida National Guard was called upon to exercise a police function. However the guard and local police agencies had to adopt many of the characteristics of a "combat" force. Anti-sniper actions, well armed patrols, the necessity to contain the rioting and prevent its spread, etc.,—all required more than just a basic "police" function. The completion of the police mission required in part, a "combat" ability. This did not conflict with the role or training of the Florida National Guard.

However, it might well have conflicted with the current definitions of the role of a state defense force.

As bad as the blurring of the line between "combat" and police roles during a

major riot is, it is not the only time when a combat ability might be required on the part of a state defense force. A state defense force is also likely to be assigned to physical security missions on high priority targets during an emergency. Nuclear power plants, communications centers, key defense plants, transport systems, ports and airfields, etc., will all be subject to sabotage in an attempt to disrupt U.S. mobilization efforts. A state defense force asked to provide security to these installations must be given the training and equipment to do the job. Once again, this infers a certain level of combat readiness.

Military Hardware—Even the more non-controversial missions to which state defense forces might be assigned present some need for the military hardware usually associated with a combat function. Search and rescue missions require aircraft, both fixed wing and helicopters. Evacuation and relocation missions require trucks and command vehicles. Emergency and disaster relief missions require water and fuel tankers as well as field hospitals and kitchens. These requirements go far beyond the abilities of even the most dedicated volunteers, to equip themselves. Further, the equipment must be compatible with that used by the regular military as well as the various National Guard units so that coordination between state defense forces and the military would be possible should the need arise.

In Conclusion—State defense forces and those who would volunteer for service within them represent an asset which would be foolish to ignore. In order to utilize this asset a comprehensive program

must be put into place which will 1) define the role of the state defense forces, and 2) standardize the training and equipment used by those forces.

Work has already begun in establishing the roles and missions for the state defense forces. The National Guard Bureau has begun working on draft proposals which will outline state defense force missions and obligations.

In order to fulfil their intended missions, state defense forces require a unique combination of police and military training. While they need not be trained in the tactics needed to assault a hill, they do require training in the tactics required to assault a building in which heavily armed persons may be holed up. They need not be trained to issue Miranda warnings when making arrests, but they do need police training in the use of minimal force for a given mission. For physical security missions state defense forces must be trained to cope with and repel, well planned and coordinated attacks. This means weaponry and training in excess of that needed for a purely police function.

As long as certain minimum standards are met, the Defense Department should find a way to incorporate state defense forces into its training programs. State police agencies should do the same.

When this country was founded a "well regulated Militia" was deemed so essential to its survival that the concept was incorporated into the Constitution. There is no reason to assume that Article 7 of the Constitution has become obsolete. Indeed in our modern era, when small organized groups have the ability to radically effect the lives of millions of people, Article 7 may be more relevant than when it was first written. ●

Tastiest Of Tablefares:

GAME SAUSAGE

Homemade sausage is a simple process, requiring little skill and limited special equipment . . .

By Durwood Hollis

WHILE THERE are a number of ways that game meats (big/small game and wildfowl) can be utilized, one of the tastiest of tablefares is homemade game sausage. Sausage manufacture is a simple process, requiring little skill and limited specialized equipment. Simply put, sausage making is the stuffing of a thin membrane (casing) tube with finely cut or ground meat and seasonings. The casing not only gives shape to the sausage, but also concentrates the delicate herbs and spices that impart their hearty flavor to the meat.

Access to a meat grinder is a prerequisite to sausage making. While there are stuffing rams and plastic tubes (horns) that can be used to fill the casing manually, a meat grinder performs better and can be used in other game processing chores. A hand operated grinder is the most economical to acquire, and also the easiest for the novice sausage maker to use. A tapered metal or plastic sausage stuffing tube (horn), designed to fit the particular grinder you select, is essential to the

project. Restaurant/butcher supply outlets and hardware stores usually carry both meat grinders and stuffing tubes.

Starting Out—Begin your sausage making by carefully trimming the meat scraps you intend to use. Remove as much fat and gristle as possible to eliminate that "wild" flavor. Grind the trimmed meat and mix with an additional portion (20 to 25 percent) of ground beef or pork. The addition of a small quantity of domestic meat tempers the flavor and adds body to the leaner game meat.

Next, season the ground meat mixture with the recipe of your choice. I particularly like the combination of "Old Farm Meat Cure" (Big Buck Products), liquid smoke flavoring and coarse ground pepper. Recipes for other sausage seasonings can be found in books on wild game cookery. Brown sugar, sage, pepper and garlic are frequently used spices that sausage makers prefer. Season sparingly, too much will impart an intense and overpowering flavor unpleasant to the taste.

Casing—Edible sausage casing is generally available at small meat markets or butcher supply houses. Casing comes either wet (brine) packed or in the dried form. Either type of casing will suffice, but you may find the dried casing less expensive. Remove the casing from the package and rinse well. Take a manageable section of casing (approximately 10 feet) and slide it onto the stuffing horn. Compact the casing against itself until the horn is well covered.

Last Step—The final step in sausage making takes a little patience and another set of hands. Slowly grind the seasoned meat mix. When the mixture begins to exit the stuffing horn, pull the casing over the end of the horn and tie an overhand knot. Continue to grind the meat until the first sausage is formed. Apply some resistance to the casing and the sausage will be firm and compact. When the sausage is the proper size (about 4 inches long), twist one complete turn. Continue to fill the casing until the second sausage is formed and then twist again. Each sausage should be twisted in the opposite direction of the preceding sausage. Continue this process until the meat supply is exhausted. Tie off the final link and the job is completed. Left-over casing can be stored in an airtight container and frozen for future use. Sausage links should be cut into usable portions, wrapped, sealed or packaged to prevent freezer burn, and stored in the frozen food section of your refrigerator.

Experience is the ultimate educator, in time you will acquire the necessary talent to make the process easier. When you have finished your last sausage link, no doubt your mouth will be watering for a taste. No need to worry, onlookers will probably already have the frying pan hot. ●



Carefully trim the game meat, eliminating as much fat and gristle as possible.



Grind the trimmed meat and mix with an additional portion of ground beef or pork to temper flavor.



Cut the sausage links into usable portions, package them in airtight containers and store them in your freezer.

ABOVE LEFT—Season the ground meat mix with the recipe of your choice.

ABOVE—Rinse the sausage casing, leaving it damp enough to easily slide onto the stuffing horn.

LEFT—Form the sausage links while slowly grinding the meat mixture through the stuffing horn.

EQUIPMENT NEEDED:

Meat grinder
Stuffing tube (horn)
Knife
Cutting Board
Mixing bowl

MATERIALS LIST:

Trimmed game meat
Ground beef or pork (20 to 25 percent of the total volume)
Sausage seasoning
Edible sausage casing

RESOURCE GUIDE:

Big Buck Products
3394 West, 8600 South
West Jordan, UT 84084
"Old Farm Meat Cure"

Moore Supply Co.
3000 S. Main
Salt Lake City, UT 84115
Sausage casing, stuffing tubes

Union Manufacturing Co.
Universal Chopper Div.
290 Pratt St.
Meriden, CT 06450
Meat grinders

White Mountain Freezer Co.
Lincoln Ave.
Winchendon, MA 01475
Meat grinders

Silent, Accurate:

SWAMP FOX

A survival slingshot with a hollow handle . . .

Staff Evaluation

THE SWAMP FOX slingshot is a unique survival weapon with many uses.

It is a powerful, dependable and accurate weapon for small game hunting or last ditch defense. It operates almost silently and can use any kind of small projectile as ammunition: pebbles, marbles, bearings, split shot, etc.

The waterproof hollow handle provides storage space for survival gear, supplementing the storage space of a hollow handle knife, or replacing it if the owner desires to carry only a full-tang knife.

The slingshot offers superior range and accuracy to makeshift bows or spears.

The Swamp Fox is made of hand-machined solid aluminum alloy. Its hollow

handle is opened by unscrewing a cap at the base which contains an "O" ring seal. The handle and cap are matte black, and knurled for a strong grip.

The slingshot comes with a few basic items: fishing line, hooks, split shot, needle and small utility blade. The manufacturer, Swamp Fox Enterprises of Isle of Palms, South Carolina, believes the contents of the handle must be determined according to the use of the slingshot and the needs of its owner. Some of the basic gear recommended are a modified Cricket lighter, matches or flint for fire starting, water purification tablets or an emergency water bladder. Ammunition can also be carried in the handle.

The Swamp Fox weighs less than 6

ounces. It is 8 inches long, 3 5/8 inches wide at the fork and 1 1/8 inches wide at the grip. The waterproof compartment in the handle is 3 inches long and 7/8 inches in diameter.

The Swamp Fox's elastic band is made of surgical tubing by Saunders Archery Company of Columbus, Nebraska. New bands could be hand made using surgical tubing from a hospital supply company, or can be ordered from Saunders Archery Company (Columbus, NE 68601—specify: general power band).

A camouflage ripstop nylon packcloth case with three-inch belt loop is available from Swamp Fox Enterprises for carrying the slingshot and bands.

While many kinds of ammunition are available, the manufacturer recommends the .45 caliber musket ball for the greatest stopping power.

The staff of *American Survival Guide* field tested the Swamp Fox slingshot and found it well made, sturdy and effective, with excellent accuracy.

The Swamp Fox Survival Slingshot is \$39.95. The carrying case is \$5.95. A \$2 shipping and handling fee is charged with each order. For more information or ordering contact: Swamp Fox Enterprises, Dept. ASG, P.O. Box 262, Isle of Palms, SC 29451. ●



The Swamp Fox Survival Slingshot comes with several basic items in its hollow handle.



A ripstop nylon packcloth carrying case with belt loop and velcro fastener can be purchased separately.



The cap at the base of the hollow handle has an "O" ring seal.



ABOVE & LEFT—The elastic band is made of surgical tubing. The rows of small bumps on the pouch make holding ammunition easy.



The carrying case fits on any belt up to 3 inches wide.

ANOTHER LEGEND IS BORN

THE LEGEND



New Hunter/Sniper Accessories: Scope Mount, Cheekpiece, 5—20—25 Round .308 Magazines.

The Galil Rifle System

.223/.308

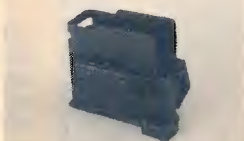
Semi-Automatic

Gas Operated

Now! You can shoot the world's most legendary rifle! No other rifle delivers the reliability, accuracy and shooting characteristics of the Galil. The Galil's unique gas operated system has proven to be the most reliable in the world.

For shooters, the Galil offers the smoothest, quickest second shot of any rifle in either .223 or .308 calibers. Designed and developed by Israel Military Industries, after thorough scientific research and exhaustive testing, the Galil outperformed every other rifle. Since its development, the Galil has continued to go through extensive testing and refinement — winning convincingly every time!

The flip-up Tritium lighted night sights feature dual luminous rear sights and a single front post - shipped as a standard feature of the Galil as used throughout the world.



.223 Magazine Adaptor



Universal Scope Mount

New Lower Prices For 1985

manufactured by



ISRAEL MILITARY INDUSTRIES

THE NEW LEGEND



The Desert Eagle Pistol

.357 Magnum

Semi-Automatic

Gas Operated

The unbeatable combination of ten rounds of .357 Magnum stopping power and the rapid-fire capability of the gas operated semi-automatic pistol is here at last!

The Eagle's unique design provides light recoil, quick recovery and superb accuracy to 200 meters. A magnum caliber pistol that is easy to control and keep on target under rapid-fire. Quick assembly and disassembly in seconds without tools allows quick interchange of barrels and easy cleaning. 6" barrel standard — optional 8", 10" and 14" barrels.

The Desert Eagle Pistol has been called "the most significant advance in pistols since 1911." It is now available at your local dealer.



10 Rounds
6" Barrel
200 Meters
Effective Range

44 MAGNUM
CONVERSION KITS
AVAILABLE SOON!

Now taking orders for 1986
delivery. Current .357
production units
convertible.

available
exclusively
from



MAGNUM RESEARCH, INC.

7271 Commerce Circle West
Minneapolis, Minnesota 55432

Better Marksmanship:

SIGHT-AID

A convenient kit for brightening your firearm or bow sights to improve your aim . . .

Staff Report

THRIFTY-BUYERS SERVICE of Middletown, New York, is marketing a kit for improved sighting of firearms using glow orange or glow lime paints.

The "Sight-Aid" kit comes with 1/2-ounce bottles of glow paint, white base coat paint, solvent for removing the paint, two brushes and a strip of 1/16-inch-wide masking tape for creating a white outline on your rear sight. Other firms sell white outline rear sights for handguns separately.

The Sight-Aid kit provides the white base coat and either glow orange—the most popular—or glow lime to paint the

sights on pistols, revolvers, rifles or shotguns. The kit can also be used to paint the sight pins on bows.

According to Thrifty-Buyers Service, Sight-Aid has numerous advantages over plastic inserts: Anyone can brush the paint on; it is brighter in intensity than many plastic inserts; it won't chip or fall off if applied properly; and it can be seen in lower light levels than some plastic inserts.

Using Sight-Aid is simple. For the front sight, shake the white base coat bottle thoroughly and brush on the paint, then let it dry for at least 12 hours. Next, shake the glow orange or glow lime paint bottle

thoroughly and paint the contents over the base coat. Let it dry for at least two hours before handling.

For the rear sight, apply the white base coat as with the front sight. If desired, use the masking tape for creating a white outline.

The solvent is for cleaning brushes and removing the base coat or glow paint if you wish.

Of course, variations on the procedure are possible. It's up to you.

For more information and ordering, contact Thrifty-Buyers Service, Dept. ASG, P.O. Box 733, Middletown, NY 10940. ●



LEFT—The Sight-Aid kit comes with bottles of glow orange or glow lime paint, white base coat paint, solvent, two brushes, instructions and a strip of masking tape for making white outlines.

BELOW TWO—The white base coat is applied to front and rear sights first, allowing 12 hours for drying.



SI

SURVIVAL, INC.

SI

THE LEADER IN SURVIVAL FOOD
& EQUIPMENT FOR OVER 15 YEARS

Quality - Value - Service

Why Buy From SI?

For the last 17 years SI—Survival, Inc.—has been supplying high quality outdoor and emergency food and equipment at reasonable prices. During that time we have seen many companies—most boasting of their size, service or prices—make a big splash and then disappear. Why have they failed while SI has continued to prosper? We think it is because we have developed a loyal and satisfied customer base. Not only do they buy from us on a regular basis, but recommend us to their friends and family. In talking to them the features they most mention is that we provide **Quality** merchandise which is of good **Value**, and give the customer the **Service** that customers deserve.

We invite you to purchase some items from this mini-catalog of our products and see for yourself why thousands of other discriminating customers have bought from SI year after year. Of course, you take no risk—our 45 day guarantee protects you in every way.

Surplus, Cosmetic Seconds & Overruns

We have found that one of the best values available is military and other government surplus, cosmetic seconds, and overruns. Our customers seem to agree with that idea. They like to buy high quality military products at about 50% to 85% off the price they would have to pay for comparable commercial products.

SURPLUS. These products can either be brand new but no longer current issue, used and no longer current issue, or used and current issue. They provide great value—that is, quality for low prices. However, used products are not for everyone. Some people feel if it is not new they cannot use it—even if after two months you cannot tell the difference. If this is your feeling stay away from Surplus. Some of the best values in surplus at this time come from Europe—not only are they well made, the items are very close to new.



U.S. Summer Service Pant. Brand new—discontinued style. Light weight yet tough weave of 55% poly and 45% wool. Four pockets, belt loops, zipper fly. Goes nice with anything. Brown/green. Sizes 29 to 36, uncuffed. Would sell for \$25 to \$35 in retail stores. #0339

\$ 6.95 + 1.75 S&H
3 Pairs \$ 18.50 ppd.

Spanish Summer Service Pant. Great camping and hunting pant. 80% poly and 20% cotton. Two large front pockets, wide belt loops, button fly. Light olive color. Knitted cuffs for blousing in boots. Sizes 28 to 36. Brand New. #0342 \$ 8.95 + 1.75 S&H

2 Pairs \$ 15.00 ppd.

Norwegian Wool Pants. Beautiful medium all wool pant. Nice shade of olive green. Four pockets, wide belt loops, button fly, suspender buttons. Very comfortable pant. Excellent for fall or mild winter. Would easily sell for \$35 to \$60 if commercially available.

#0340 New, Unissued \$ 22.50 + 1.75 S&H
2 pair \$ 39.95 ppd.



FINEST WINTER CLOTHING

Six Pocket German Winter Pants. Issued but almost like new. The finest heavy wool winter pant made today. Includes two large cargo pockets. Double waterproof knees and butt area. We have customers tell us these pants are better than their \$120 commercial pants. You must try to appreciate the value. Sizes 29 to 40 but we must charge more for 37 to 40s due to extra cost to us. #0464

\$ 27.50 + 2.50 S&H
2 pair \$ 49.95 ppd.

Sizes 37 to 40 add \$2.00 per pair

German Winter Combat Shirt: Matches above pants. Made to protect against frigid German winters. Waterproof double elbow and yoke. Many include a German army patch on each arm. Better quality than the finest Pendleton. Would sell for \$50 if commercially available. Small, Medium and Large. #0304

\$ 18.50 + 2.00 S&H
2 Shirts \$ 37.50 ppd.

French Foreign Legion Sandals: These have been in storage since 1952, but are brand new. Leather uppers and super tough synthetic soles—made for years of use. Light tan but show some soiling

from storage. If new in retail stores you would pay \$60.00. Sizes 9, 10, and 11 only, but 8½ will fit into 9. #0328.

\$ 12.50 + 2.00 S&H
2 pair \$ 22.00 ppd.

Used German Canteen. Super buy, this heavy aluminum canteen is fully cleaned and sterilized. Cover is insulated and the top makes a great cooking cup with a long fold-out handle. Attaches two ways to belt. You could not buy a new one for \$20.00. #6459

\$ 6.00 + 2.00 S&H 3 Canteens \$ 15.00 ppd.



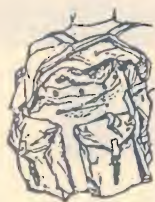
Used German Mess Kit. 3-piece kit of good quality aluminum. Outside shows use and some dents, inside are nice and clean. New these would sell for \$20. #0348

\$ 4.95 + 1.95 S&H 2 Kits \$ 10.00 ppd.

SI Equipment 2322 Artesia Blvd., Redondo Beach, CA 90278

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A BAG FOR EVERYTHING



Large Italian Rucksack. One of the best items we have. Issued, but 95% new quality. Made of very strong cotton/nylon duck. Main bag area is about 3800 cubic inches—and you can extend that. Two large outside pockets and two unusual equipment semi-pockets on side. Lots of buckles and straps—rich gray color. Includes a quick release strap for getting out of heavy loads rapidly. Could not be matched for \$45.00 in discount stores. #0343

\$ 13.50 + 3.50 S&H
2 rucksacks \$ 27.00 ppd.

Large Italian Barracks Bag: Looks like a designer bag. Made of same tough material as rucksack. Metal strap across top means handle never rips out regardless of load. Unusual security system with chain that threads through metal loops and can be secured with lock (not provided). 24" long and 9" square. Issued, but 90% new. Would sell for \$45 to \$70 if available new in stores. Satisfaction guaranteed. #0318

\$ 14.95 + 2.75 S&H
3 Bags \$ 39.00 ppd.

THE BAG. Designed to carry heaviest tools. Made of super-thick cotton/nylon canvas and has full wraparound 1" rope handles. Two people could carry anything they could pick up—tools, sports equipment, etc. 14" x 30" with belt closure on top. Cost the government \$23 each in 1952! #0338

\$ 3.95 + 2.00 S&H 4 Bags \$ 18.00 ppd.



RADIATION DETECTION

Certified Civilian Quartz Dosimeters. These are used civil defense units that we have had checked for leaks and are calibrated and certified for accuracy. High level only 0-200 R/hr. New ones sell for \$125.00. #9946

\$ 39.95 ppd.

Combination Special. Manual charger and two certified and calibrated civilian dosimeters. If new the combination would sell for at least \$345.00. #C/9928

\$ 95.00 ppd.
2 Sets \$ 175.00 ppd.

GARY NORTH APPROVED



Certified & Calibrated Survey Meter. Measures high level radiation from .05 to 50 R/hr. V 710 model that has been certified and calibrated to be the best used meter available. New one costs \$585.00. #0000

\$ 185.00 ppd.

TAB — RADIATION PROTECTION

Potassium Iodide Tablets Block Radiation

A proven method to stop thyroid damage from radiation—for full details see page 96 of *Nuclear War Survival Skills*. Each person needs 14 tablets for protection. Supplied to military and government personnel. Some advertise these for \$10.00 for only 14 tablets but we offer 98 tablets in sealed bottle. #1525 \$ 22.50 + 1.75 S&H

2 Bottles \$ 39.95 ppd.

COSMETIC SECONDS. The military have strict contracts—items must be just so or they are not accepted. For instance, in freeze dried meat rations the patties cannot be broken when delivered to the military. Therefore, when a company is doing 5,000,000 patties and break only 2/10 of 1% they still end up with 10,000 broken patties. They really do not have a market for them so what do they do? They sell them to us at very low prices and we can pass the savings on to you. We always mention what is cosmetically wrong with an item when they are seconds.



Save Up To
80%



Military Freeze Dried Meats. These are products made to strict military specifications but for some cosmetic reason—usually because the patties get broken, they are not acceptable for military use. All items here were part of the 1984 or 1985 contracts and are packed in heavy-duty No. 10 cans with storage atmosphere and will store a minimum of seven to ten years. All are fully cooked and can either be eaten right from can or added to boiling water to be table ready.

Beef Patties, Broken. Rehydrate and make back into patties, mash up for tacos, etc. Over 44.00 worth of meat per can. #HC06

\$ 19.00 + 2.25 can S&H

Case of 6 cans \$ 85.00 + 7.25 S&H

Pork Patties, Broken. Tastes like sausage patties. Break for breakfast or in rice, etc. Over \$48.00 worth of freeze dried meat per can. #HC04

\$ 21.00 + 2.25 can S&H

Case of 6 cans \$ 92.00 + 7.25 S&H

Chicken, Diced. Proportional diced chicken makes great stews, salads, casseroles. Over \$55.00 of freeze dried chicken per can—but we bought hundreds of cases so you get it for a fraction of that. #HC05

\$ 19.95 + 2.25 can S&H

Case of 6 cans \$ 85.00 + 7.25 S&H

Diced Beef. One of our best products. Tender cooked beef in 3/4" dices. Use anywhere you can use diced or ground beef. Over \$49.00 worth of freeze dried diced beef. #HC01

\$ 22.00 + 2.25 can S&H

Case of 6 cans \$ 99.00 + 7.25 S&H

SPECIAL SAVINGS

Special Mixed Case. 2 beef patties, 2 pork patties, 1 chicken, 1 diced beef. About \$288.00 worth of meat—even at above special prices it's worth \$125.00. #C/0583 \$ 85.00 + 7.25 S&H

Limit 4 Cases

Our Best Selling Product!

Hash Brown Potato Patties, Broken. One of our most popular items. These are tasty hash browns fried in light oil, seasoned and just a touch of onion—and freeze dried for indefinite storage life. Eat as snack, rehydrate as great hash browns, or use as base for stroganoff, gravy, or sloppy joes. No ad can describe the usefulness and taste of this product—we actually have customers buying it 30 cases at a time for use in camps and for scouts! Each No. 10 can contains \$17.50 worth of freeze dried hash browns. #F010

\$ 6.95 can + 2.25 S&H

Case of 6 cans \$ 29.95 + 8.25 S&H

5 Cases \$ 145.00 ppd.

Freeze Dried Scrambled Eggs. Eggs that are table ready in minutes using only boiling water. Add bacon bits, sausage patties, or bell pepper for a special treat. Each No. 10 can holds about \$50.00 worth of commercially freeze dried eggs. BHA and BHT added to increase storage life. Will store indefinitely. #F025

\$ 11.50 can + 2.50 S&H

Case of 6 Cans \$ 49.95 + 7.50 S&H

5 Cases \$ 225.00 + 15.00 S&H

SI Emergency Food & Equipment — Quality - Value - Service

OVERRUNS. These occur for at least two reasons. First, if you are doing large numbers you often end up with more than you need to fill the contract and the government will not always take more than contracted for. The other reason is that those who make items for the military have found that it is profitable to make military items for the commercial market. This is where most of the BDUs and other U.S. clothing comes from. While the latter are good buys, the actual overruns can usually be offered at better prices.

**100%
SATISFACTION
GUARANTEED**

GI Issue BDUs

This is the current battle dress uniform being issued to the army. It includes the reduced I.R. profile material of 50% nylon and 50% cotton. The Shirt features four large pockets and reinforced elbows. The Pant has six pockets including two large cargo pockets on the leg. Also includes reinforced seat and knees. These are not "made to military spec" BDUs, but actual issue items. We have all sizes from XS to XL, so include waist, length, height and chest size for closest military fit. We offer a special price for buying sets and also for two pants and a shirt since the pants always wear out first. I think you will find our prices are right.

- #0310 Shirt \$ 24.50 + 2.00 S&H
- #0311 Pant \$ 25.00 + 2.00 S&H
- #0312 Set with Shirt & Pants \$ 42.50 + 2.00 S&H
- #0313 Set with Shirt and 2 pair of Pants \$ 66.00 + 3.00 S&H



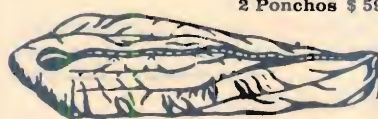
**Genuine
G. I.**

New Lightweight Ripstop BDUs. These are the latest warm climate issue uniforms made of 100% ripstop cotton. Same excellent features as the standard BDUs. Now available in the same sizes. All brand new manufacture and genuine GI issue.

- #0320 Shirt \$24.50 + 2.00 S&H #0321 Pant \$25.00 + 2.00 S&H
- #0322 Set of Shirt & Pants \$ 42.50 + 2.00 S&H
- #0323 Set of Shirt & Two Pair Pants \$ 66.00 + 3.00 S&H

This is the current issue poncho in modified woodland camo. It is made to be used in combat and one size fits all. Made of heavy waterproof rip-stop nylon, it is large enough to cover full combat pack and equipment. Don't leave home without one. #0308 \$ 34.50 ppd.

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Who Is Buying MRE Rations?

In talking to customers who are buying these items we have found them being used for everything from emergency storage to being resold. Some of our wholesale customers are buying them in large quantities and reselling them for \$1.25 to \$1.75 per pouch. They are also being used in camps for field rations when taking groups camping or horseback riding. Others tell of using them in hunting and in offroading. The thing that people like is that they need no refrigeration, are easy to prepare, cost less than freeze-dried foods, store for years, and above all they taste good. Actually, MRE rations are probably the most versatile and easy to use product on the market today. If you have found an unusual use for these rations or other MRE components please drop us a note.

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We got these MRE component retort pouches of 1984 meat products at a very special price. They include eight items in all: Ground Beef with BBQ Sauce, Diced Beef, Ground Beef with Macaroni and Gravy, Ground Beef Manni Cotti, Sliced Beef with Sauce, Ground Beef with Gravy, and Chili with Beef. They are, of course, overruns and packed to high military standards in triple layer retort pouches inside a heavy cardboard box—they have a shelf life of seven to ten years without refrigeration. Easy to prepare in boiling water or against an engine block. We are selling them in groups of 16—two of each excellent product. They are selling in surplus stores for about \$3.00 a retort pouch. #R116

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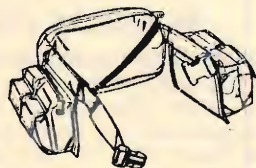
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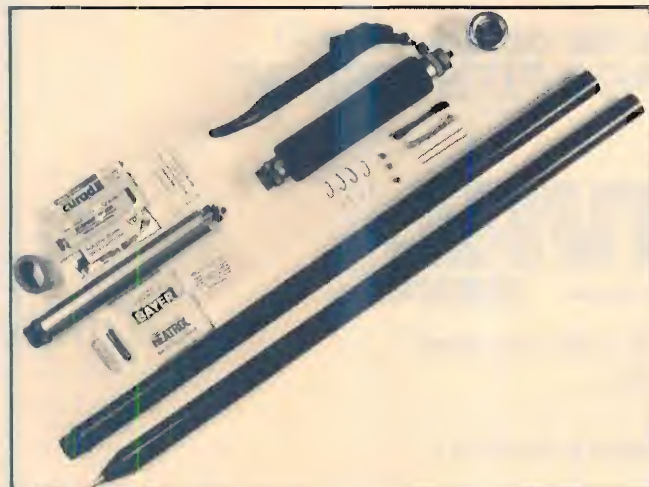
TRAILBREAKER

From primitive man to cultured gentleman, the walking stick has always been more than just an aid to movement . . .

Staff Report



LEFT—The Trailbreaker walking system can be assembled as a 36-inch cane or a 56-inch staff.



LEFT—The Trailbreaker comes with a precision compass and mini-survival and first aid kits and separates into four sections that can carry additional gear.

RIGHT—The system can be used as a shooting aid to steady your aim.



ABOVE—The Trailbreaker adds a measure of safety to every hiking experience.



WALKING STICKS have been used by man since his emergence as a distinct species on this planet. Early men often fire-hardened and sharpened one end of this multi-purpose tool to serve as an aid in food gathering and self-defense. From primitive man to cultured gentleman, the walking stick has always been more than just an aid to locomotion. Classically defined, the walking stick supports and sustains the user, in reality however, this multi-functional invention is the embodiment of versatility.

The folks at Lifeknife Incorporated (P.O. Box 771, Santa Monica, CA 90406), have redefined the walking stick. Updated and dressed in the most modern materials, the "Trailbreaker" walking system brings high technology to this age-old tool. Made from rugged aircraft aluminum (T-6063), 7/8-inch in diameter and hard anodized to resist abrasion, the Trailbreaker consists of four precision-machined sections for easy storage. Adjustable, by removing and adding sections as needed, this modern walking stick can be assembled in any combination of sections, from a 36-inch evening cane to a full size 56-inch walking staff. Its suggested retail price is \$49.95 plus \$3.50 for postage and handling.

O Rings—Each hollow compartment is

sealed with "O" rings to exclude moisture and provide dry storage for survival essentials. The Trailbreaker comes complete with a mini-first aid kit (aspirin, electrolyte tablets, surgical blade, disinfectant, insect bite swabs, antibiotic cream, suture material and a tourniquet) and a mini-survival kit (fish hooks, line, sinkers, snare wire, needles and matches), safely stored within one of the gold anodized 6-inch staff sections.

Other survival gear such as a water purification device, frog gig, knife set, knife sharpener, light stick, thermometer, saw and space blanket can be easily stored in the 20- and 22-inch lower staff sections and are available from the manufacturer as options. Future options include an ice axe blade, snow basket, hatchet, tool kit, fishing rod tip, shovel, blowgun and competition orienteering compass.

A precision compass is built into the machined brass top knob. When the brass knob is removed from the staff, a steel awl is exposed that can be used as a staff section wrench. When the compass is unscrewed, a camera can be mounted on the exposed threaded tip and the Trailbreaker used as a monopod. Remove the knob from the staff and the awl itself can also be used as a camera mount in wood or earth.

Steel Tip—The Trailbreaker has a

hardened steel staff tip to reduce slippage on wet rock, snow and ice. A rubber tip cap is also provided to protect the steel tip when desired. A cushion open-cell foam grip covers the top-most staff section and provides a firm and controllable hand rest. There is an adjustable nylon wrist strap that allows the staff to be used as a rifle or pistol rest. Especially useful in wide open sage country for antelope hunting or in farmland for whitetail deer stalking, the Trailbreaker can help make those long shots count.

Self-Defense—An added dimension of use for the Trailbreaker is that of self-defense. Prudent handling of the walking stock can prevent an attack when a real threat occurs. While the use of either the awl or the sharp steel staff tip should be considered that of last resort, the defensive capabilities of this product should not be overlooked.

For centuries walking staffs have been one of man's most reliable companions. Useful in many roles from walking stick to tent pole, fishing rod to ice axe, the Trailbreaker walking system, available at recreational equipment stores, is the perfect companion for hikers, hunters, outdoorsmen and survivalists from every walk of life. ●

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EXPLOSION

Continued from page 29

tion, the explosion temperature, sensitivity, and power. The more sensitive explosives are used in modern "explosive trains" to set of intermediary charges (those with moderate sensitivity) which in turn initiate reactions in the main charges, which are least sensitive, but have greater overall blasting power.

The use of gunpowder (black powder) as an explosive declined in the 19th Century. It was replaced by three main types of composition: those explosives based on unstable molecules, such as the fulminates and azides; ammonium nitrate and the organic esters nitrocellulose, nitroglycerine and PETN; and the nitro-compounds, a large group which includes picric acid, TNT, tetryl and RDX.

Explosion/Fire Dangers—Explosions may occur with a resulting fire, without a resulting fire, or because of a fire. But explosions and fires are often associated with each other.

Explosions may be divided into two categories: high yield and low yield. The difference between the two is the rate at which energy is released. Those explosions with higher energy release rates will be high yield and vice versa. The distinction between these two types of explosions is somewhat arbitrary and there is some overlap.

One important difference between the two types is the resulting damage effects. High-yield explosions tend to produce shattering of nearby materials and cratering of floors and foundations. This is generally accompanied by high-velocity projectiles and/or fragmentation. Low-yield explosions do not normally produce this shattering. Their action is more of a pushing or shoving of nearby materials.


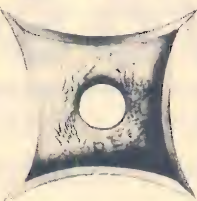

The destructive effects of the two types of explosions can be similar, particularly when equivalent amounts of energy release are involved, though the damage effects in the immediate vicinity of the explosions may differ.

For example, detonating dynamite in a room or building might result in a hole in the floor, shattering of nearby furniture and blowing out of nearby windows, either from a pressure wave or projectiles. The chance of a resulting fire is low. But vaporization of a sufficient amount of gasoline with subsequent ignition (low-yield explosion) would produce no hole in the floor, no shattering of nearby furniture, but could result in ignition of combustible furniture and drapes, and blowing out of windows and walls.

In the case of the dynamite explosion, a fire, if it resulted, would probably be from secondary ignition sources, such as dis-

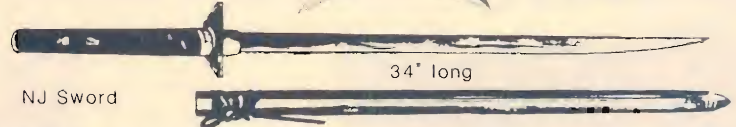
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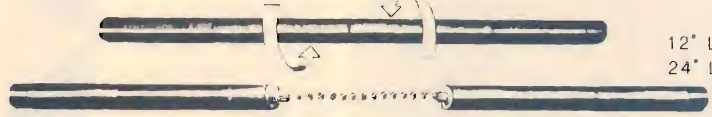
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W-200 Tempered & Sharpened \$95.00
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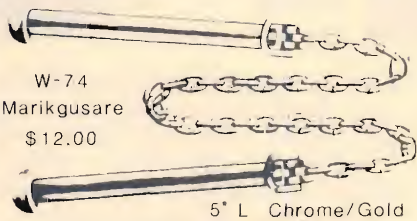
Sword Stand W-43 \$15.00



W-217 Ball Bearing Chain Hide-A-Chuck

W-202 Tele-Chuck
13" L
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T-69
NJ Foot Spikes
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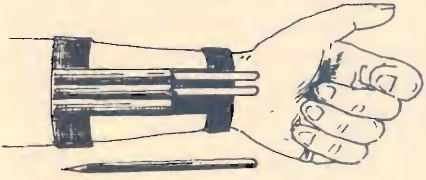
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Guidelines:

BACK TO SCHOOL SAFETY

What parents and children can do to avoid dangers between home and school . . .

By Paul Garson



LEFT—Milk cartons, grocery bags, magazine and newspaper ads focus attention on plight of missing children. Many companies now donate free announcements.

RIGHT—Local agencies can supply audio-visual aids for parents and children alike. Pamphlets, coloring books, guidelines are focused on prevention.



APPROXIMATELY one and a half million children are reported missing every year. Of that number about one million are classified as voluntary runaways. From 25,000 to 500,000 children are abducted by parents involved in custody battles, technically the victims of "child stealing" as differentiated from kidnapping. At the bottom end of the statistics are some chilling figures: 20,000 to 50,000 child disappearances each year that remain unresolved.

In other words, 20,000 to 50,000 families suffer the anguish and pain attendant to the loss of a child. There are initial victims, the children themselves, and residual victims, the parents, a fact often overlooked by the statistics.

The crimes of molesting and murdering children are so repugnant that the public, in the past, has had difficulty not only facing up to the reality of the situation, but devising strategies to help protect children from those that would do them harm. More recently, media coverage has focused greater public and official attention on the issue of child safety, child abuse, and crimes against children. In effect, the issues are "hot items" today, thrust into public awareness. Greater openness and communication has occurred, and as a result both the private and public sectors have sought to develop programs geared to increasing the security of our children from the very real menaces that plague our modern society.

The Statistics—The U.S. Department of

Justice compiles a large compendium each year, almost four hundred pages of facts and figures, charts and tables entitled *Crime in the United States*, a component of the *Uniform Crime Reporting Program*. The most recent edition records that in the latest statistical year, a total of 19,308 murders occurred in the United States, according to law enforcement reports. Of that total, 893 victims were children ranging in age from infants to 14 years.

On first glance the relatively small numbers seem to contradict the earlier statements, but one must remember there is a difference between a documented murder and an "unresolved" case involving a missing child. In California, for instance, figures show about 600 such "unresolved and pending" cases yearly.

The focus of this article coincides with the fall return to the school classroom, the beginning of the new school year which sees a large flow of children to and from school grounds, a period when criminal as well as accidental mishaps often occur. There are numerous public and governmental agencies, on the local, regional, state, and national level, which have been formed to address the problem of crimes against children. Some of them deal with missing children, some with abused children, some with molestation cases, others with helping relatives cope with missing or murdered children. The business community has become actively involved in helping to locate missing children. And of course, local police agencies have implemented programs to combat the growing

problem. Emphasis should be placed on the fact that child safety programs vary in size and impact based on many factors, among them being budgetary allowances. However, a general trend to increased allotments for such programs is evident.

School Trips—We will examine some of the specifics of the programs and sample some of the community efforts which focus on ensuring your child's security regarding trips to and from school.

What can parents do to prevent or avoid child abductions and other crimes against children? It is not feasible or even healthy to keep your child under strict surveillance at all times, but children can be instructed and prepared to handle stressful situations in which their lives are endangered, either from criminal or environmental sources. A good point to remember is do not underestimate a child's intelligence, common sense, or for that matter, bravery in the face of adversity. Children have resisted attempted assaults and abductions successfully, and any child can be given an added "edge" if he or she is adequately counseled.

When instructing your child in the basics of safety, one must be careful not to overshadow the lessons with an aura of fear and dread, or convey the misconception that the world is full of malignant monsters and that all people are to be feared and distrusted. An open, honest and warm rapport with your child is necessary if the lessons are to serve their purpose in a posi-



ABOVE—Local police agencies often have regular “in school” programs in which officers visit classrooms, establish a positive police-child image, and explain the various safety measures to the children. Here Officer Phil Tuttle, School Resource officer, Community Resource Services Bureau of the Anaheim (CA) Police Department, speaks to a class. Other private and public agencies present similar programs.

RIGHT—Local businesses help battle crimes against children. Here, Phil Huven, an employee of the Federated Group, uses video equipment to record individual children for permanent record. The store chain in So. Calif. offers service free.



tive way.

Various organizations publish guidelines regarding avoidance of child abuse, kidnapping, sexual abuse, molestation and similar crimes, and ways to mitigate them. With regard to child abductions and molestations, it is important to note that most cases involve “familiar individuals,” that is persons, even relatives, already known by the child. This type of criminal occurrence outweighs, numerically, the instances of “stranger assault.” However, the effects are the same.

The previously quoted statistics on the number of child murders should not obscure the fact that thousands more kids are physically assaulted, with the effects often very serious and long lasting.

No Stereotype—What does a child molester or abductor look like, one might ask, so that children can spot them at first glance. The answer is, of course, that there is no stereotype description. Child abductors and molesters can look like the proverbial little old lady or the next door neighbor, be of any age, of either sex, from any socioeconomic background.

Often the disappearance or abduction of child is linked to sexual assault whereas in the past it might have been more likely linked to kidnapping for profit. Today, with the publicity surrounding such nationally prominent disappearance cases as those involving Adam Walsh, Kevin Cooper and Laura Bradbury, the public consciousness has been raised and alerted to the very real threat.

This article will not include a discussion of child abuse, child molestation, and kidnappings as a social or criminal phenomena. However, we will present methods by which children can best be protected from harm.

As the authorities tell us, the unpleasant truth is that between two thirds and three quarters of all reported child molestation cases involve a person known to the child, an acquaintance, neighbor, relative, family friend, etc. Statistically, more men than women are offenders, and many offenders were victims of child abuse themselves.

Authority Figures—Because children are generally so trusting of adults as authority figures, they can easily be coerced into cooperating with the molester who may employ bribes, gifts, even feigned friendship to gain the child’s confidence and loyalty. The offender can also manipulate the victim into playing “games” or use threats. Often fear and embarrassment prevent the child from discussing what might be an ongoing situation.

The effects of child molestation, depending on the severity and duration of the occurrences can cause fear, confusion, guilt, anxiety, a sense of rejection, distrust of adults, withdrawal, problems at school, running away, nightmares, depression. These are symptoms of which parents must be aware as indicators. Above all, they must not be ignored.

Parents—It is important for the parents

to control their own emotions if a child declares himself a victim of molestation. Don’t deny the problem. Remain calm, and do not blame, punish or embarrass the child, rather, give emotional support. Explain to the child, that he or she is not to blame, and that no harm will come as a result of telling of the molestation. Answer the child’s questions, and obtain as much information about the incident as possible, and write the information down for the authorities. If necessary, seek medical assistance for the child.

Immediately contact your local police and report an incident or suspicious behavior. In addition, local support and information is usually available from community social service agencies who can supply psychological and emotional treatment for the victim and the victim’s family.

Prevention—It should be stressed that the above statements involve “after the fact” procedures. Prevention, naturally, would be the best course. What can be done to lessen the chance of child molestation or abduction?

Know where your children are, whom they are with and what they are doing.

Encourage your children to talk with you about any problems or questions that they have, and encourage them *not to keep secrets from their parents.*

Discuss the subject of sexual abuse with your children and how they can protect themselves.

Tell your children that “nobody can ►

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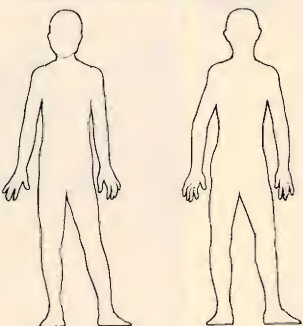
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INDICATE BIRTHMARKS, SCARS OR MARKINGS.



MAKE ADDITIONAL REMARKS ON BACKSIDE OF CARD.

AD-9



ABOVE—John Walsh whose son Adam was abducted and murdered was instrumental in bringing about legislation concerning crimes against children. Story was translated to television and helped focus national attention on the issue. (UPI/Bettmann Newsphoto)

LEFT—Many local police agencies and businesses supply fingerprinting services free to parents who wish to have record.

hurt you or Mommy and Daddy” to dispel any fear of threats that could be made by the molester.

Teach children to say “No” under certain circumstances that pose danger.

Advise your children when and by whom they may be touched in a personal or intimate manner.

Alert your children to never approach or enter a strange car. Make sure that they understand that you would *never* send a stranger to pick them up.

Encourage children to walk and play with other children and to avoid playing in vacant or deserted areas.

Open those lines of communication with your children. Don't make the subject of child molestation taboo in your home. Recognize its existence and learn together with your children just how to protect them.

Many communities sponsor Child Molestation Awareness seminars in which parents and children take part with the subject explained in a fashion, often via puppets, easily comprehended by the children.

Child safety exists not only outside the home, but also within. Remember also that these guidelines have no value unless they are carefully explained to your children.

Child Guidelines—Children who are home alone, even for brief periods of time, should follow these safety precautions.

1. They should not give information over the phone, especially their name, address or that they are home alone.

2. Better, yet, instruct them not to

answer the phone except when you call at a pre-arranged time.

3. They should know how to call for police for fire assistance. Be sure these numbers are on the phone (decals are available free).

4. Leave a number where they can reach either you or a trusted adult.

5. Be sure your child knows his/her name, address and telephone number (many do not).

6. They should keep all doors locked.

7. Discuss with them whom they may admit to the house. No one else should be permitted to enter.

8. If there are firearms in the house, keep them in a locked case or closet and make sure your child does not have access to the key.

9. Children should never leave the yard without permission.

10. They should avoid playing in deserted areas or near public restrooms.

11. Very small children should only play in the backyard or in supervised areas.

12. It is safer for them to walk or play with friends.

13. They should always come straight home from school.

14. They should not take shortcuts through alleys or deserted areas.

15. When out shopping with your child, never let him or her out of your sight. (Criminals often rely on crowded public places as easy “hunting areas.”)

16. Children should never be left alone in unattended cars.

17. They should never enter anyone's house without your prior approval.

18. They should never get into a vehicle

with someone they do not know well.

19. If anyone attempts to touch or grab them, they should scream, run and immediately tell someone. (Screaming is very important. In fact, special “screams” are taught by some assault prevention groups. A criminal is often deterred by the loud shouting of a potential victim. Children, unfortunately, must be taught this technique since they are prone to silence and cooperation with adults.)

20. If someone does attempt to get your child to enter a vehicle or house, help the child to remember as much as possible and report it at once to your law enforcement agency.

21. Establish a password which only the immediate family knows, and instruct the children to run away from any stranger who approaches them without first giving the secret word (experts disagree over the Good stranger-Bad stranger differentiation. Some counsel children to avoid strangers entirely).

22. Prepare a plan of action for your child if he or she gets lost. Point out information desks, check out counters, security police, etc.

23. Instruct your child's school to call you immediately if your child is absent.

24. Make a mental note of your child's daily attire.

25. Keep current medical and dental records of your child.

26. Do not put your child's name on his clothing. That way, no stranger can address him by name and gain his confidence.

27. Be alert to a teenager or adult who is paying an unusual amount of attention to



LEFT—Children should be cautioned against getting too close to strangers and their vehicles, and not to accept rides home with strangers. Criminals often use bribes or promises of gifts to entice children.



RIGHT—Walking a child to school, pointing out problems and rehearsing best actions to take in case of emergency help prepare the child for return to school.

your children or giving them inappropriate or expensive gifts.

28. Be careful about babysitters and any other individual who have custody of your children.

29. If some stranger wants to take your child's picture, have the child tell parents or teachers.

30. Teach children they have a right to be assertive and say "No" to anyone who tries to take them somewhere, touches them, or makes them feel uncomfortable.

After The Fact—Although proper prevention training can greatly reduce the chances of your child being lost or abducted, "after the fact" measures can help in the recovery of victimized children. Such measures include the fingerprinting of your child. This service is often offered by your local police or through your PTA. Fingerprints can aid in identifying children who have been missing for long periods and have grown up or been altered cosmetically that makes easy identification difficult.

Also, fingerprints can help identify bodies, a grim but realistic fact to consider. Police officials will also tell you that often fingerprints are no longer identifiable after long periods of deterioration. However, fingerprinting is important in helping to identify children who are perhaps runaways or involved in custody child stealing cases.

Another procedure now popular is videotaping your child. Some local businesses offer this service free of charge. A form is filled out with pertinent information, and then the child or parent reads the

information while the child is being videotaped. The form and videotape is kept by the parents.

Identification bracelets or necklaces are available, and help in relocating lost children. Electronic devices similar to beeper alerts are also available which notify a parent when a child has wandered beyond a "safe limit."

Parent Commitment—Perhaps the single most important factor in child safety is Parent Commitment. Committed parents strive for a trusting and loving relationship. No matter what happens, their children will not be afraid to confide in them.

Harmful situations can occur almost anywhere. Children should be aware of their surroundings and careful to approach unusual situations with caution. One technique found very useful is the "rehearsal approach." For instance, a parent can walk the child to school, point out possible hazards, reviewing the safety guidelines mentioned earlier, and "rehearse" possible situations. This can involve everything from proper response to strangers to pedestrian safety rules. This type of parent involvement not only prepares the child for emergencies but also cements the confidence necessary to maintain a positive outlook and approach to the world at large.

Develop a plan and rehearse it with your child. An example is the familiar public service message concerning what to do in case of fire in which each family member is instructed in the proper escape routes and methods. If a child feels he or she is in

danger, they should have recourse to a trusted family friend or relative, a telephone number to call (and the money to make the call!), or be able to recognize proper authorities, e.g., police officers.

The "Block Parent" concept is another approach that works. Parents on a particular block get together and select a Block Parent, a home where all the children of the neighborhood can go in case of need, a house where parents will be at home at almost all hours. This is similar to the Neighborhood Watch program and can be an adjunct of it.

The Buddy System is another approach to traveling to and from school in safety. Similar to the scuba diver who never dives alone, the method calls for a "team" approach whereby two or more children travel in groups to and from school, counting on safety in numbers.

The Check in-Check out System requires more disciplined behavior from the child. He or she notifies an adult upon each departure from and return to home. The problem with some systems is that the parents begin to slack off, and the preventative measures fade away in disuse. The choice of a logical and practical system of measures must take into account all the realities. In other words, don't embark on a program that is doomed to failure because of over complexity. And, constant reaffirmation of the rules involved will keep the child informed and certain of your commitment as well as reminded of the importance of proper security.

Not only are proper safety habits essential for around home and to and from

Continued on page 75



An American diplomat is taken off a hijacked Kuwaiti airliner in Tehran to be murdered as an Iranian negotiator tries to stop the action. (UPI/Bettmann Newsphotos).

Continued from page 22

terrorists, the airline employees are warned not to try tricks of this nature because the terrorists are already aware of them and might become angered.

The rule is, when dealing with a group of people with political aims, it's advisable not to insult their intelligence. That could be the fastest way to end up with a bullet in your head.

Talking to the hijackers around the clock in an effort to wear them down doesn't always work either. To make sure they didn't get worn down, the hijackers in the recent crisis of TWA flight 847 brought additional armed gunmen. Finally, they took the hostages off the plane so the responsibility could be shared.

But there is one thing that does work, not only in a hijacking situation but an air emergency of any kind: Stay cool and calm, no matter how rotten things get. "You can be totally in chaos inside, but somehow you can't show that to the passengers," the security expert explained. "You get freaked out and they will also," he said.

President Reagan proposed placing air marshals aboard planes, similar to what was done in the early 70's when there was a rash of hijackings of American planes to Cuba, El Al and Swissair—two of the

world's safest airlines—assign armed guards to their most sensitive flights, but the measure has proved no sure thing against terrorism: A Jordanian Boeing 727 that was hijacked in Beirut had eight sky marshals aboard.

Airline officials fear that stray bullets from a gun battle between sky marshals and terrorists could penetrate the wall of a plane, causing the cabin to decompress; they also could puncture fuel and hydraulic lines and start a fire.

Some veteran airline pilots say that trying to prepare for a hijacking, especially by a terrorist group, is an act of futility. One Eastern Airlines captain told me, "Trying to predict what will go on during a hijacking is like trying to predict the way a mother would behave if you eloped with her daughter. It's nearly impossible."

Several leaders of airline unions believe someone should be giving more thought to the topic of terrorism in the air. One union chief told me that the FAA only requires the airlines operators to cover a limited amount of material in their training programs; and because time is money, it's easy for the airlines to rush through the programs.

Passenger Tips—Readers of *American Survival Guide* magazine who travel can

use these suggestions, which come from a number of airline security and aviation experts:

Choose a U.S. carrier, preferably one flying directly to your destination. If there is a refueling stop or you must change planes, select a flight landing in West Germany, the United Kingdom, Turkey, Oman, Sri Lanka, Japan or South Korea.

Always select an aisle seat and avoid flights that carry contingents of religious pilgrims to or from their destinations.

Wear inconspicuous clothing. Do not wear expensive jewelry, carry expensive cameras, luggage or a portable computer. Blend in, don't be conspicuous.

Don't carry sensitive company documents or papers that could be construed by ignorant hostile eyes as government documents or "intelligence" materials.

Don't spend more than the minimum time at the airport or train station waiting to check in and board. Report anyone or anything that looks suspicious or out of place. In particular, look for people who appear physically fit and are acting in a nervous manner (constantly licking their lips, going to the bathroom frequently) and who do not "fit in" for any reason. *Do not hesitate to report your observations.* Terrorist-hijackers often act agitated, tense and generally ill at ease. ●

GET THE EDGE!

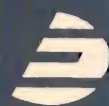
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Volt Vendor:

GENERATOR

Learn to generate your own electricity for the day when you may need it . . .

By Ralph Zumbro

AMERICA IS two centuries old and, for the first half of its history, our ancestors were independent individuals who carved a nation out of the western lands with no more than an axe, a knife and a rifle. Fleeing the monarchies of Europe for an unfettered life in the forests and mountains west of the Mississippi, they willingly faced hardships and danger rather than submit to the crowded, ordered life of the eastern cities.

During this century, we have been steadily surrendering the freedom they valued so highly. Hopelessly hooked on electrical and mechanical necessities and luxuries, we have become a nation of consumers. Chained to a central grid, we must depend on unstable countries for the fossil fuels which feed our generating stations. In both cities and rural areas, the terms "brownout" and "blackout" have become common to our language. Even where the energy supply is adequate, the cost of hookup is sometimes so exorbitant as to prevent many families from buying remote land.

Alternative—Fortunately, there is an alternative. We are a technological people and, for us, it's easier and cheaper to learn to generate electricity than to return to the animal-powered skills of days gone by. Every one of our tools, appliances and luxuries can be run by small, affordable, personal "utility companies."

When setting up to provide your own kilowatts, you must take your total lifestyle into consideration. Your needs and wants will determine the size and type of power plant you eventually choose, and you are the one who must live with the result of your decision. Your eventual choice of a generator set will become enough a part of the family to have its own name (ours is "The Brute"), and you will become very solicitous of its health and well-being.

Generator Day—Once we evicted the gremlins from our personal electrifier, a typical day's schedule would go like this: At 6 a.m. the alarm goes off and I get up to check the battery voltage, fire up the generator, plug in the coffee pot and switch on the water heater. My sensible wife stays in bed till the coffee's hot. The batteries were a bit low, so we need a fairly long run for charging. This is a light load and, to avoid inefficiency, breakfast is cooked electrically after the water is hot. One hour's run has cooked, heated water

and charged batteries using only *one* quart of fuel.

Lunch is sandwiches requiring no fuel, but today is laundry day—another light load. Wait a minute—those shelves for the last batch of technical books need to be built. The mental arithmetic goes like this: Generator capacity is 3,000 watts, the washing machine load is 600, the skill saw 800 and the water heater totals 1,500 watts. Twenty-nine hundred is a little too close to maximum, so I heat water first; then we can wash, cut wood and still charge batteries. This takes two hours, at varying capacities, using one-half gallon of diesel.

Come suppertime, we have the choice of a charcoal steak on the grill or a roast in the oven. Rain sets in, and that makes the decision for us. The generator set goes on again, powering the convection oven and charging batteries. One hour later, the roast is done, and we have burned exactly *one* gallon of fuel for the day. The lights, refrigeration and entertainment are all 12-volt, and the batteries are full.

Available, Affordable—This is not experimental hi-tech; there are thousands of installations like this all over the world on fishing vessels, construction sites, in pipeline stations and mountain retreats. The technology is available and affordable. Whether you have bought raw, unpowered land, are nervous about the future, or are facing repeated outages, a personal electrical system makes more sense than relying on a vulnerable central network.

Right about now, most people will be asking how long one of these machines is expected to last. "Won't it eventually die and leave me in the cold and dark?" In 25 years of working on marine electrical systems, battery banks, generators and convenience equipment, I have encountered some *ancient* machinery. One diesel had its log book lost in World War I and another had 12,000 hours on the clock—with only oil and filter changes. We all know someone who has a big, old Detroit clunker that is still purring after 300,000 miles; and some outboard boat motors seem to go on forever.

Tricks—What's the secret—how are some people able to buy a machine and bequeath it to their grandchildren, running perfectly? Low speed operation, regular maintenance, clean oil and filters are the only esoteric "tricks" you will need

to know. First, and most important, is low speed operation, and here is where the majority of generators designed for week-end and emergency use fall down.

The **weekness of most small units** is that they turn at 3,600 r.p.m. at full capacity, with no warmup. How long would you expect your automobile to last if, every day, you started it cold and, pulling a trailer, punched it up to 70 miles per hour? Not long; but that's what many folks expected from a generator. These relatively inexpensive, light-duty sets can only handle short-term emergencies and occasional vacations. If they are used continuously, most of them will be on the ragged edge of explosion in less than one year. Regardless of sales hype, most of the equipment on the market is not made for extended life use. The set must turn at either 3,600 or 1,800 r.p.m. The problem is to keep speeds down to the point where cooling and lubrication can keep up with heat and friction.

Permanent Convenience—Let's go back for a moment to the automotive analogy. If a high speed generator is equivalent to 70 miles per hour, then the slower one is equal to about 40. Remember that old car with 300,000 miles on it? Grab your calculator and put the mileage in, then divide that by 40 miles per hour. That old car has clocked 7,500 hours. Managed efficiently, a household electric plant would need to be on only two hours per day. At that rate, the old engine could have kept a family in kilowatts for the last 10 years. Remember the diesel I mentioned—12,000 hours and still going strong. At two hours a day, that's 16 years of operation. One company advertises 20,000 hours of life between overhauls—the first one coming due in 2012 A.D. So take heart, you can buy or build convenience and comfort into your life on a permanent basis.

What's Available—In order to make a wise, economical choice of machinery, you have to know how it works and the strengths and weaknesses of models presently available. Unfortunately, many units on the market today use what is known as a single bearing generator. The outer end of the armature or rotor has one bearing, and the other end is bolted directly to the flywheel. This is a simple, economical system, requiring only an adaptor between the crank case and the field shell. It also means the engine has to run at armature speed of 3,600 r.p.m., in most cases, and this is just too fast for extended life. The other flaw is that when the fast-turning fuel hog needs serious repairs (believe me, it will), you are out of the electricity business. Since this is a Siamese unit, you cannot couple up another power source while the original one is being repaired.

While we are on the subject of single bearing models, let's look at another feature. Many of them have starter wind-

ings in them. This means that, by triggering a relay, the set becomes a giant motor which acts as an engine starter. this calls for sliding contacts, known as brushes, to get high amperage current into the armature. Sooner or later these will get fried, and then you have a perfectly good machine you can't start and you can't pull the starter off for repairs. @\$#&#! Therefore, you will want either a slow-turning single bearing combination with a separate automotive type starter, or a two bearing energy producer that can be belt driven from any source. Each of these methods will produce a simple, reliable source of kilowatts.



This is the author's home generator adapted from military surplus parts.

Most small engines can be adapted to our needs, but a screaming Go Kart propulsion unit is not going to power you into the 21st Century. The faster it has to turn to deliver the necessary horsepower, the quicker it will wear out. The critical speed is about 2,500 r.p.m.; and those that are kept below this range seem to go on endlessly. This automatically eliminates the direct coupled 3,600 r.p.m. kind as a long-term choice. They're okay for weekends but, if you're moving out here permanently, you'll need a 25-year type and its spare parts and tools.

The slower it turns, however, the bigger it must be to provide the required horsepower. The increase in size will cost more initially, but it has the advantage of less wear and maintenance over the decades. The desirable kind is a slow-turning industrial machine, not a lawnmower power unit. Briggs-Stratton and Tecumseh, for instance, have heavy duty iron models, as well as the lighter aluminum versions. The companies which make the commercial generator sets also sell the power sources separately. It has to be basic, rugged and deliver its horsepower at low speeds. One that is rated at five horsepower at 4,000 r.p.m. may deliver only three horsepower at 1,800. In fact, many long-lifers are simply de-rated versions of a company's larger machines. Ruggedness means bulk; the casing and cylinders must be thick enough and hard enough to take knocking about, high heat and mechanical loading. It should have iron, not aluminum cylinder liners, and automotive type replaceable bearings on the crankshaft and connecting rods. A diesel is not necessary for longevity. I have personally owned and used a

Hercules gasoline propulsion unit that was last manufactured in 1956—it is, at present, alive and well.

Other Considerations—In addition to picking heavy duty machinery, several other things should be considered. Do you want gasoline or diesel in your installation; and should you use air or water cooled? As a general rule, gas burners up to 20 horsepower are air cooled, and diesel are water cooled. You *can* get air cooled diesel and water cooled gas—if your design has to have them.

Since the "internal" combustion discards 70 percent of the energy content of its fuel as "waste" heat, its cooling system must be selected so as to complement your heating needs. If, for example, you use water as a solar heat storage medium, then you will want liquid cooling. By plumbing the pump and tubing into your storage tank, you kill two birds with one stone. First, you can trap as much as 80,000 B.t.u.s an hour; second, your generator is kept warm and ready to run by the thermal mass. If you're burning fossil fuels, you're actually releasing solar energy that was stored millions of years ago, but with this method *all* the heat potential gets utilized. By installing automotive heaters in your house, you gain the ability to retrieve the trapped thermal energy. As far as the set is concerned, your living space is its cooling radiator.



A battery bank for lights and other small, steady drains is where you store reserve energy.

Solar heat storage which uses air as a transfer medium and rocks or masonry as a storage mass is best served by air cooling. The heated discharge is simply ducted into the thermal mass. **CAUTION:** The combustion fumes are lethal and must never be allowed to contaminate breathing air. You have to direct the exhaust away from the living area.

Electronic ignition is nice and easy; just a magnet, sensing coil and a pulse pack. However, it can be lobotomized by a stray electromagnetic impulse from a high power transmitter, a police radar, a lightning bolt . . . or one of Comrade Gorbachev's bargain basement planet busters. So stick to the models with the old bomb-proof coil and condensor ignition; you can always add a pulse pack for quick starts.

Diesels have a reputation for being extraordinarily finicky about their diet.

Low speed generators are another matter; at 1,800 r.p.m., there is more time to burn less efficient fuels. Our old Onan will accept No. 1 and No. 2 diesel, No. 1 and No. 2 furnace oil, kerosene and JP4. The manufacturers specify that one quart of 30-weight lube oil be added to each 25 gallons of kerosene and No. 1 furnace oil; (do not try this in your diesel without the manufacturer's approval). After consulting with the manufacturer, you may find you have more options than you thought



A household energy monitor and load switches are important.

possible. For example, the Chinese have been burning tung oil and methane in a 70/30 mix in their small diesels for decades. In Sweden, SAAB, the auto company, has taught one of their diesels to digest rape seed oil. Just recently, an American, named Bob Harmon, drove a sunflower oil-fueled Peugeot auto from coast to coast.

Gas Substitute—So much for compression ignition mills. But how about a substitute for gasoline? The entire country of Brazil is converting to homegrown alcohol and, in this country, gasohol has become a common word. For many years, methanol (wood alcohol) was the standard racing fuel at Indianapolis. We don't have an energy shortage. It's actually a knowledge blockage.

Fuel compatibility is also a factor; you can get very frustrated trying to stock up for four different mechanical thirsts. So, when purchasing your equipment, take into consideration what is available in your area, and which ones are likely to be obtainable during an emergency . . . whether it's in your backyard or in Tehran.

Efficiency—Once you have a low speed, easily maintained home comfort producer, you must be able to use it efficiently. It must be loaded to about three quarters capacity and run for relatively short times.

Continued on page 68

Emergency Situations:

NAVY SURVIVAL TRAINING

Every time a pilot climbs into the cockpit of his aircraft he knows something could go wrong . . .

By David M. Knotts



This sign hangs at the entrance of the Land Survival School in Pensacola, Florida.

NOTHING IS 100 percent sure. Every time a pilot climbs into the cockpit of his aircraft, even for a routine flight, he has tucked away in the back of his mind that something could go wrong—a fire, a flameout or a malfunction of any one of a dozen electronic components that could lead to an emergency landing or bail-out.

The statistics are there too. It is estimated that roughly 60 to 65 percent of all military pilots will find themselves in an emergency situation during their careers. Some of these emergencies subject survivors to harsh environmental conditions until their rescue.

Recognizing this, the Naval Aviation Training Command in Pensacola, Florida, established a Land Survival Division on November 6, 1944. The school's mission is to train all naval aviators—both officer and enlisted—in the techniques of survival in a non-hostile environment. An average of 4,500 students each year complete the survival training. These include Navy and Marine Corps pilots, naval flight officers, flight surgeons, aviation officer candidates, and enlisted air crewmen.

Accepting the Navy's invitation to attend the school, I took my seat at 7 a.m. sharp to begin eight hours of classroom instruction and orientation prior to heading out to the field for three days of practical instruction. I must admit, that I was somewhat skeptical as to how effective the course could be with only a four-day time frame. However, that skepticism vanished before the third lecture of the morning when it became apparent that the quality of instruction, organization of material and professionalism of the instructors was

far superior to any program I had seen in some 15 years of active work in the survival arena.

To Begin With—The Land Survival Division's headquarters and lecture hall houses a survival exhibit with displays of survival gear, sample shelters, traps and snares, homemade equipment, and dioramas depicting various survival situations, all of which are excellent learning resources in themselves. Additionally, the school has a small zoo and herbarium. The zoo contains live caged animals, from alligators and snapping turtles, to deer and a variety of poisonous snakes that are representative of wildlife downed aviators would likely encounter in North America. The herbarium has a greenhouse and garden with a living display of several species of wild edible plants for instructional purposes.

Commander McCrory, the division's Commanding Officer began the day's instruction by reminding the 112 aviators of the seriousness of the training and emphasizing the point that all the equipment in the world would be of no value if not used, and the training would be worthless if the survival victim did not know how to apply it. "The school's mission," said McCrory, "is to provide you with the basics in non-hostile area survival. Your job is to apply that knowledge and survive."



The traditional Navy-issue survival knife, bulky and dull, proved to be ineffective when compared with other knives carried by students and instructors.

Lectures—The day's lectures included such topics as survival hazards and primitive medicine, fire and shelters, plant and animal foods, water and basic land navigation. Most of these sessions introduced concepts that would be applied during the three-day field instruction.

One interesting point, but somewhat scary for future aviators, brought out in the *survival hazards* and *primitive medicine* session is that approximately 50 percent of emergency ejections from an aircraft result in broken teeth, a fracture, or dislocated limbs. Survival under any circumstance is tough but an injury, however minor, greatly compounds the situation.

Medical Training—Except for the discussion on medicinal plants, most of the recommended medical procedures were standard first aid. However, as a result of experience of downed pilots and P.O.W.s in Vietnam, the concept of "maggot therapy" was taught as an alternative treatment for severe infections. Infections leading to gangrene could be checked by allowing maggots from flies to eat away the dead infected flesh. As primitive and gross as it sounds, it is an effective temporary stopgap.



Marine pilots plan a route during a land navigation exercise.

Food—Since approximately 75 percent of available survival foods will be vegetation, considerable time was spent on wild plants as a food source. As a survival instructor I have always been wary of the military's promotion of "taste test" to determine if a plant is edible or not. To me, the cost-benefit ratio of taking such a risk is not worth the potential nutritional value of a plant in question when there is an equal potential of becoming seriously ill or dying a gut-wrenching death. I have always taught and have been taught, "When in doubt, don't eat." However, the survival school staff felt strongly about the need to maintain a high energy level, and handled properly, the test could keep risk to a minimum. For those of us who live and work in a specific geographical region, it is not difficult to learn the majority of the key useful plants, but, when you are a Navy pilot who theoretically could fly out of Corpus Christi, Texas, one morning and go down in the Amazon that afternoon, it's not a practical task. When pilots are

assigned to a new area the squadron training officer briefs them on the useful plants of their region.

Water—If there was one point the school staff were emphatic about it was the importance of water to one's survival. The fact that you can go several weeks without food but without water you may die in a single day in an extreme environment was continuously drilled into the students. The concept of keeping your body at saturation level was not only taught but enforced when we were in the field.

Before being dismissed for the day, we were briefed on the survival field exercise regulations and organized into color groups of 20 students and subdivided into teams of five. Each group and team was assigned leaders.

Equipment was limited to items that might be reasonably carried in flight status, such as: gloves, extra socks and underwear, knives, matches, toothbrushes/paste, short pants or swimsuit, flashlight, insect repellent, medicine, and a personal survival kit containing such items as magnesium fire starter, fish hooks/line, plastic bag, toilet paper, space blanket, raincoats, aluminum foil, etc. (for training purposes, food of any type was prohibited). All of these items were to be stuffed in any one of a dozen pockets that virtually cover a Navy flight suit. I was issued one and found them to be very comfortable and durable.



A solar still is checked for water. A still of this sort can produce a cup of water a day.

Before continuing with the course instruction I would like to say a few words about the instructors and students. First of all the instructors, officers and enlisted personnel, were probably the most dedicated, committed group of men I have had the privilege to be associated with. All staff are volunteers for the positions—a two-year rotation for officers and three to five years for enlisted. Preference is given to men with solid rural, active outdoor backgrounds. If they have not already, each instructor will attend advance training at the Navy Survival Evasion, and Rescue and Escape (SERE) School in New Brunswick, Maine. Printed at the bottom of one of our handouts was the slogan: "There is

no job too great, no detail too small to save a life." These men truly adhere to that principle.

As for the students, the best thing I can convey to you is, "We are in good hands." If the men I went through the school with are representative of the officers and enlisted people making up the Navy and Marines, then we can rest assured that the military is not going to pot as we are led to believe. Commander McCrory pointed out that this was the trend for the last two to three years. Said McCrory, "It does your heart a lot of good when you walk up to a young man and ask him why he joined the Navy and he says, 'Why sir, it was my patriotic duty.'" Needless to say, Grenada and Beirut have fostered an increase of enlistments from such high caliber young men and women.



Students rig a parachute shelter.

Field Exercise—The field exercise is held in the 1,000-square-mile woodlands of Eglin Air Force Reservation some 60 miles northeast of the Naval Air Station. Students and staff are bussed to a section of the reservation where an actual survival situation is simulated for the next three days.

Instruction begins with campsite selection and shelter construction. Since, in all probability, a downed aviator will have his parachute with him, much emphasis was placed on its use. What impressed me was the 101-plus uses this light weight, strong material could be put to. Shelters, from one man hammocks and sunscreens, to teepees and lean-tos capable of sleeping four or five men were demonstrated. Since parachutes are not water proof, the key to maintaining a dry shelter is to double the material and stretch it taut. The importance of this procedure was brought home during a Florida rain storm that dropped on us later that afternoon.

It was about this same time that we began to build fires. There is nothing like a deluge of rain to test your fire building skills. I was able to get mine going with some lighter pine (pine heart) and a home-made fire-starting concoction of diesel-soaked sawdust. Petty Officer Spinner, our instructor, did equally well, if not better,

with lighter pine and the relatively new magnesium fire starters. The shaved magnesium burns at some 4,000 degrees F. and nothing less than sealing off its oxygen supply will put it out.

For the first 24 hours, food was limited to what each group could forage. We were fortunate to find a few remaining clumps of wild blueberries, grapes and hackberries. There was an abundance of sawtooth palmetto to be had. The basal growth area of the leaves has a nut like taste and was very popular with the students. We managed to catch a few crawfish and later that evening one of the staff brought over a fat armadillo "for the civilian, compliments of the commander." Although I have grown up with armadillos, this was the first opportunity to eat one and in spite of my hunger it was exceptionally tasty.

The second evening, we were given some raw beef and taught how to smoke jerky. Again, the parachute was used to make a small teepee shaped "smoke house" which was very effective in processing the jerky.



A parachute is used to cover lean-tos.

Throughout the next two days we were given instruction in making cordage from native plants, constructing traps and snares, field safety and sanitation, and additional instruction in land navigation. Although there was plenty to drink from a nearby stream, we experimented with various ways to obtain water. I was particularly impressed with the green vegetation methods. One called for collecting as many green leaves and grasses as you could stuff into a plastic bag. The bag was then tied off and holes were poked all around it before placing it inside a second bag. This bag was tied off air tight and the whole bundle set in the sun. The heat from the sun drew moisture from the green vegetation. This in turn seeped through and collected in the second bag. By day's end, we had close to a cup of water. A similar process was used on a living shrub or small tree. A bag was simply slipped over a branch containing a large number of leaves. Again, the sun's heat drew moisture from the leaves which collected in the bag.

Parachutes—I continued to be amazed at the tremendous resource a parachute can be when we were taught how to make

Continued on page 58

IMI Rifle:

GALIL .223

A rugged, efficient assault weapon...

Staff Evaluation



ABOVE — The Galil is formidable in appearance.

LEFT — Shooters found the Galil easy to operate and accurate.

BELOW — The rifle breaks down into six basic parts.



ABOVE & RIGHT — Some of the accessories available for the Galil are a cheekpiece, carrying sling, cleaning kit, universal scope mount and Cordura carrying case.



THE GALIL rifle is the latest addition to the contemporary assault rifles used by the Israel Defense Forces.

In service with Israel's armed forces since May 1973, the Galil 5.56mm (.223 Rem.) was born out of the military's dissatisfaction with the performance of some of their rifles during the Six-Day War of 1967. There were reports of jamming and other malfunctions, many of them due to the harsh desert environment.

The Israelis noted that the assault rifles of their Arab adversaries, the Soviet AK 47s, had performed excellently during the fighting. After the war the Israelis rigorously tested several rifles firing the 5.56mm (.223 Rem.) cartridge, including the M16, against the performance of the AK47. They concluded that the AK47 was the best rifle for their purposes and that its action was worth copying.

Israel Military Industries then developed the Galil, almost pure Kalashnikov in design but scaled down to take the .223 cartridge.

A semi-automatic model of the Galil .223 became available for sale in the U.S. in 1982, and recently, a 7.62mm (.308 Win.) semi-auto Galil was introduced for sale in this country. The Galil in both calibers is distributed in the U.S. by Magnum Research, Inc., of Minneapolis. The 7.62mm Galil was reviewed by this magazine in the June 1985 issue.

MR 372—Magnum Research provided *American Survival Guide* with a .223 caliber Galil MR 372 semi-automatic assault rifle, with folding stock and bipod and fore-end carrying handle, for testing and evaluation. Included with the rifle were several accessories: a black Cordura carrying case from Assault Systems of St. Louis; universal scope mount, cheekpiece; carrying sling and cleaning kit.

Built To Last—The air cooled, gas operated Galil is built to withstand rough handling under adverse environmental conditions and still provide dependable service.

With bipod and carrying handle, the Galil weighs 9.5 pounds (4.3 kilograms), the same as an FN FAL or AK47 but heavier than an M16 (2.9 kilograms) or the Soviet replacement for the AK47, the AKM (3.1 kilograms). Without the bipod and carrying handle, the Galil weighs 8.6 pounds (3.9 kilograms). A loaded 35-round magazine adds 1.56 pounds of weight and a loaded 50-round magazine adds 2.2 pounds.

The trigger and hammer assembly and bipod have the Kalashnikov double-wound-wire coil springs for superior performance and long life. And the Galil has the same rotating-bolt locking system as Kalashnikov with bolt carrier and gas piston machined as one piece.

For ease of handling by right- or left-handed shooters, the Galil cocking handle, safety catch lever and magazine may all be

manipulated from either side of the rifle.

The folding stock, borrowed from the FN FAL, locks into position when extended by means of a spring-loaded mechanism. To collapse the stock, push down firmly on the stock near the locking mechanism while supporting the rifle with your hip.

The barrel assembly contains a flash suppressor that doubles as a platform for a grenade launcher or a bayonet mount. The bipod folds under the wooden hand guard when not in use. The bipod also functions as a barbed wire cutter. When not holding the bipod, the rear end of the hand guard is a bottle opener.

An aperture battle sight is fitted with settings for 300 and 500 meters. IMI states that the effective range of the Galil is 500 meters. The barrel has a hooded post sight. The rifle is also outfitted with flip-up tritium night sights front and rear, said to be effective to a range of 100 meters.

Operation—To load the Galil, a loaded



This photo shows the Galil just after a round was fired. Note the empty case exiting the ejection port, just below carrying handle.

magazine is tilted upward and inserted into the magazine opening at the bottom of the receiver. Next, place the safety catch lever in the "F" (fire) position, and pull the cocking handle all the way back briskly and release it. By this method a round is stripped from the top of the magazine and chambered. The Galil is ready to fire. When the safety catch lever is in the "S" (safe) position, the rifle cannot be fired and the ejection port is closed to prevent dirt from entering. To cock the rifle, the safety catch lever must be in the "F" position.

When the trigger is pulled, the hammer is disengaged from the trigger sear and hits the firing pin, which in turn strikes the primer of the cartridge in the chamber.

When the rifle is fired and the bullet passes the gas port near the front of the barrel, gasses under pressure enter the gas cylinder and push the gas piston and bolt carrier backwards.

This backward movement of the bolt carrier causes the bolt to rotate as the lug cam in the bolt carrier acts upon the bolt lug. The rotary motion of the bolt draws the empty cartridge case from the chamber and, after completion of the unlocking action, the bolt carrier and bolt retract fully to the rear, completing the extraction process. When the bolt carrier moves backward, the return spring compresses and the empty cartridge case is ejected through the port on the right side of the receiver. The empty cases, noticeably crimped, are thrown with considerable force from the ejection port forward and to the right of the rifle. On test firing, the casings were flung 15 to 20 feet.

During the rearward action of the bolt carrier and bolt, the hammer is cocked and engaged by the trigger sear.

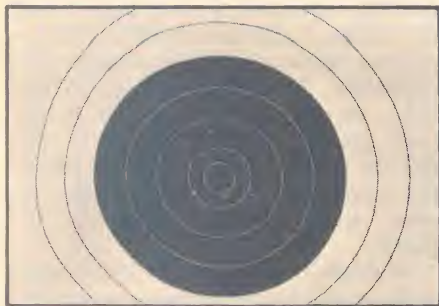
GALIL MR 372 SEMI-AUTO: TECH SPECS

Caliber	5.56 x 45mm
Action	semi-automatic
Operation	gas piston, rotating bolt
Lengths:	
Barrel, inches (mm)	18.1 (460)
Barrel with flash hider, inches (mm)	19.1 (487)
Overall, inches (mm)	38.5 (979)
With stock folded, inches (mm)	29.2 (742)
Weights:	
Rifle with bipod and carrying handle, pounds (kg)	9.5 (4.3)
Without bipod and carrying handle, pounds (kg)	8.6 (3.9)
Sights:	
Front	hooded post, flip up tritium night sight
Rear	aperture flip adjustable "L" for 300/500 meters, flip up tritium night sight
Sight line radius, inches (mm)	18.7 (475)
Rifling	R.H. 6 grooves, 1 turn in 12 inches (305mm)
Muzzle velocity, approximate, ft/sec. (m/sec.)	115 (950)
Prices, suggested retail:	
MR 372	\$1,099
MR 361 (without bipod, carrying handle)	\$999
.223 35-round magazine	\$47.95
.223 50-round magazine	\$54.95

Manufacturer

Israel Military Industries, Israel
 Magnum Research, Inc.
 7271 Commerce Circle West
 Minneapolis, MN 55432
 (612) 574-1868

U.S. Distributor



This five-shot group was printed from 100 yards.

When the return spring expands, it pushes the bolt carrier and bolt forward. The bolt shoves the top cartridge from the magazine forward and into the chamber. Meanwhile, the extractor grips the cartridge case rim. The continuation of the forward movement causes the bolt to rotate and, through the locking lugs, locks the bolt against the receiver.

Field stripping the Galil is a simple process and can easily be done in darkness, once the routine is learned. First, press the cover catch inward and lift the cover off of the receiver rear end first. Next, press the cover catch inward again and pull the return spring upward and out. Now pull the bolt carrier fully to the rear and extract it from the receiver. Hold the rear end of the gas cylinder and pull it backward and lift it out. That's it! Re-assembly after cleaning follows in reverse order.

At The Range—The Galil was carried to the firing range in its handsome black case. Staff members looked forward for weeks to testing this beauty. It was decided the rifle would be fired using only the bipod instead of the usual sandbag rest. All shots were made from a seated position at a bench.

Thirty-five rounds of IMI Eagle 55-grain, full metal jacketed ammo were loaded into the magazine which was then snapped into place in the rifle.

All of the 100 rounds of ammo were fired without a single malfunction.

Three shooters operated the Galil at the range that day. Groups of 3½ and 2½ inches were obtained at 100 yards with iron sights.

Evaluation—Some shooters might consider the Galil MR 372 a bit heavy for a .223, and its price of \$1,099 could be considered steep for the budget-minded.

But to the ASG staff, there is no question that this is a high quality firearm, rugged, well made and reliable—and very accurate. For those discriminating individuals who desire these qualities in a weapon, the Galil MR 372 is worth the price. ●



Elevated platform fires are effective for providing a smoky ground-to-air signal.

Continued from page 55

gill nets for catching fish and turtles from the shroud lines. Each shroud line (parachute chord) is made up of several three-strand nylon strings covered by a braided nylon sheath. By cutting into the sheath, the individual lines may be removed and unbraid to provide additional cordage as needed. The sheath itself is strong enough to use as a bow string on a bow drill for fire making or to tie poles together for any number of construction needs and each individual strand when removed is impossible to break by hand and may be used for anything from fishing lines to dental floss. So versatile a resource is the parachute cord, I have elected to replace the boot laces on my hiking boots with the cord to ensure an adequate supply of cordage in an emergency.

Rescue—Anyone lost or in a survival situation wants to be found and rescued. A major portion of the field instruction was devoted to the building of ground-to-air signaling devices. Each color group had to build a signal fire capable of producing sufficient smoke to bring in a helicopter that was in the area. The technique used by the Navy requires the construction of an elevated platform. Dry tinder and kindling is arranged on the platform with a large quantity of green vegetation packed around it. Because the platform is elevated, a good supply makes the fire burn rapidly and produce a tremendous volume of smoke. It was quite exciting to touch off the fire and a few minutes later have a rescue helicopter roar in. Training like this gave the young aviators the confidence they needed that with some common sense and application of basic survival skills they

will be able to survive until rescued and return safely home.

Give Up Itis—In a conversation with the school staff it was generally agreed that most of the men who die in a survival situation die as a result of fear and "give up itis." "There appears to be a trend," said one of the officers, "that young people of today do not have the strong will to live that older men in the same situation demonstrate." He went on to cite a situation in which an aircraft went down in the waters off Alaska. All the crew evacuated safely to rafts but because of inclement weather it was some time before they were rescued. Three of the youngest and strongest of the crew soon died. No explanations could be given except that they just gave up!

The young aviators I trained with did not strike me as the type who would give up. From a navigator from South Chicago who had never camped out a day in his life to a Marine pilot who grew up on a Georgia farm hunting and fishing all his life, all were trained by the best and there is no doubt that they are not adequately prepared to meet whatever challenges will face them in the future.

Way Of Life—The four day training that I was skeptical of turned out to be more than adequate for a basic course. Later these men will go to SERE school for advance training which will include survival under hostile conditions and P.O.W. indoctrination. Additionally, each man will continue to receive training throughout his career. For the aviators of the Navy and Marine Corps, survival is nothing to take lightly. It's a way of life. ●

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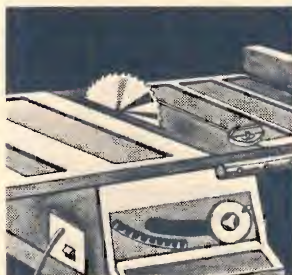
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FRESHWATER FORAGING

Continued from page 27

improving the numbers of fish present (e.g., the Sacramento River, with the aid of the Shasta Dam).

These fish management situations are not unique to North America. They are occurring worldwide. *Man creates the problem. He is also the solution.*

Our inland fisheries have gone through changes and will continue to do so as long as the world exists. The future is bright, if we, the custodians of these fisheries, don't lose sight of the overall picture.

Protein Sources—Within the confines of the North American Continent, are many sources of animal protein in the form of freshwater habitat fish and associated creatures. Numerous species of fin fish and a smattering of crustaceans, bivalves, amphibians and reptiles are abundant, nutritious and are readily available to the survivalist in search of foodstuffs.

It is essential that a potential freshwater forager be able to identify readily the various "freshwater systems." Following, is a basic summary of physical features that enable the freshwater forager to discern such systems. He then, will be able to fish each encountered system effectively (i.e., using salmon methods on a lake inhabited by bass might catch some bass).

Standing Waters—Generally speaking, "standing waters" are lakes and ponds, usually comprising open basins filled with water possessing limited internal water motion (there are exceptions—sub-surface inflow of water "springs," as well as water circulation that is associated with wind). To confuse matters even further, in many locales, "standing water" areas exhibiting greater surface acreage are called ponds while smaller basins are labeled lakes. The usual nomenclature is lakes are larger bodies, ponds smaller.

For this article, "standing waters" have been reduced to the following simplified classifications—1) Large, deep, cold water basins; 2) Medium/large shallow warm water basins; 3) "Two story" cold/warm water basins; and 4) Man and animal constructed impoundments—A) Medium/large reservoirs; B) Stock and farm ponds; C) Beaver flowages.

"Moving" or noncontained waters, for survival purposes are: 1) Large, major warm water river systems; 2) Major cold water systems; 3) Streams, brooks, springlets of cold water; and 4) Small, warm water creeks and tributary streams.

Large, deep, cold water basin types of standing waters exhibit the following physical and biological conditions: they contain a pronounced ratio of depth to surface area, usually layers of cold, well oxygenated waters at mid to lower levels;

bottom composition is primarily composed of ledge, rock, gravel, sand with minimal emergent/submergent water vegetation (i.e., lilly pads, coontail, etc.), and limited amounts of organic material (i.e., usually in the form of decomposing leaves/needles of surrounding land based vegetation). The actual amount of living plankton (minute organisms at the beginning of the fish food chain) is low, in other words, a water basin of limited biological productivity. Nevertheless, such basins are prime exhibitors of high dissolved oxygen levels, coupled with cool year-round water temperatures and low turbidity (suspended solids in the water column), which in turn foster the habitat of many cold water species, including the trouts, chars, and salmon.

Shallow, warm water basins possess their own specific qualities, both physical and biological. In essence, a relatively shallow depth to surface area ratio is present. Bottom composition could be a combination of ledges, rocks, gravels and sands, but usually with a high percentage of muds comprising organic materials (i.e., leaves, needles, remains of dead submergent/emergent vegetation such as lilly pads, coontail, cattails). In many instances, dissolved oxygen levels are lower, while water temperature is higher than cold water basins. Many basins of this type exhibit stratification. In many instances, the usual high temperatures of mid-summer waters deplete the oxygen level, thus narrowing the comfort/survival factors of many fish and limiting the species that reside in those waters: largemouth bass, catfish, pickerels, pikes and panfish.

"Two story" cold/warm water basins possess the characteristics (physical/biological) of both deep cold water basins and the shallow water type. Essentially a mixture of physical components temperature, dissolved oxygen, bottom composition, depth) and biological components (organic muds/vegetation or lack of) with each specific site being inhabited by preferred species. For example, trout might locate in a deep, cold, well oxygenated hole, largemouth bass along the dropoff, with still other bass and accompanying chain pickerel content amongst the emergent lilly pads of a shallow soft bottom (organic mud) cove of several feet in depth.

Man-made impoundments can be found in all previous categories. One must simply evaluate the existing physical/biological conditions present. An impoundment is usually identified by a visible dam or dike constructed of cement/concrete, gravels or sod-covered earth. Surface area can vary from 10 to 20 acres upwards to hundreds of square miles.

Stock and farm ponds are small, often overlooked sources of protein. These "miniature fish factories" can be further categorized by being either cold or warm water basin types. Cold water types usually con-

tain trout or char, often planted (stocked) fingerlings or fry. Subsequent stocking of small fish is essential to maintain fish production unless a suitable spring or inlet stream is available, thus providing the proper physical/biological site for spawning (water temp., rate of flow, gravel of proper proportion to construct nest, etc., to be discussed in detail in an upcoming article on freshwater aquaculture). Warm water types usually contain self-sustaining populations of warm water species (i.e., largemouth bass, bluegill, catfish, etc.). Suitable spawning/nursery sites are usually at hand.

Beaver flowages often offer a readily available source of fish protein. The dam structure is easily recognized by the "control random piling" of sections of tree trunks and branches. Dams erected on cold flowing year-round streams or springs, usually possess excellent populations of cutthroat trout in the West, while the upper Midwest and New England usually harbor good populations of "native" or brook trout. Other fish many times found in association are bullhead catfish and suckers, all good candidates for the survivalist's freshwater food program. Beaver ponds located in southern regions often provide suitable habitat for warm water species, primarily catfish, largemouth bass, and an assortment of panfish.

Moving Waters—Moving or non-contained water systems include: 1) Large warm water rivers (including brackish sections) usually characterized by large, moderately deep rivers varying from several hundred yards in width, to several miles across (i.e., Mississippi River, lower). The physical bottom, in many instances is composed of organic muds, laced and mixed with clays, gravel, sand, occasional rock ledges and similar outcroppings. The water temperature range is usually severe (i.e., 32F. to 80/90F.) with both cold and hot water periods (varies with climatic influence). Turbidity is usually a factor, with much water-conveyed silt being suspended, especially during the spring flood periods. All these physical characteristics combine to produce a moderately harsh aquatic environment, with varying amounts of D.O. (dissolved oxygen) present. The usual fin fish populations are of the "durable" variety, with bass, pike, sunfish, walleyes inhabiting the "tamer" sections (more favorable D.O., temperature, turbidity, etc.), with tolerant catfish and rough fish (carps, buffalo, etc.) being the greater poundage of the fish biomass.

2) Major cold water river systems (including brackish sections), usually exhibit relatively cold waters that are well oxygenated, which conditions prevail year round. The sources of these relatively consistent waters are numerous springs, brooks as well as infiltration through porous gravels

Continued on page 62




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FRESHWATER FORAGING

Continued from page 60

that line the flowage. Bottom and shoreline composition is primarily of rock, gravel and sand, thus affording suitable spawning habitat for salmon, trout, char; with pike, bass, and suckers spawning in the warmer sectors (these areas might be a small man-made impoundment or "meadow/valley stretch of the stream). Stream width might vary from 50 yards to 500 yards or more. Biologically, the cold waters are relatively low on the productivity scale, nevertheless, much protein may be procured if fished intensively and properly. The bottom is usually relatively free of submerged vegetation, and lacks large areas of organic bottom compositions.

3) Springs, brooks, rivelets of cold water emit flows of ice cold water year round, "warm" in winter, cold in summer. Small volume flows (counted in cubic or fractions of cubic feet per second) provide habitat for surprisingly large populations of small trout and other edible fin fish. The bottom composition might vary from rock and gravel in the Rockies of Utah, to unwadable organic "muck" bottoms of a hemlock swamp stream in Maine. In both instances, the angler can either literally step across or jump across such fish populations.

4) Small warm water stream creeks and tributaries, physically may vary from 10 to 100 feet in width, usually possessing a relatively mild gradient (When compared to the majority of cold water streams. Exception to the rule is a meadow type trout stream of the Rocky Mountain foothills). The bottom composition is varied: rock, ledges, sand, clays, silts with pockets and pods of organic base muds. Many such systems are subjected to severe seasonal flooding (with its accompanying turbidity) combined with seasonably rather warm water temperatures (lower D.O. and reduction of comfort/survival range of fish), only moderate stress-durable fish would be encountered (largemouth bass, assorted panfish, catfish and "rough" fish, the carp, sucker, buffalo, etc.).

Fish Availability—A prime factor that influences the availability of fresh water food fish is pollution, in organic form, industrial/chemical origin, and thermal form (water of excessive temperature that robs D.O.). Pollution encourages a variety of fish diseases brought on by the additional stresses. In areas of nuclear waste, either from everyday power plant discharges, or nuclear accident, from waste storage sites or from weapon detonation ("the big one"), special care must be taken by the survival forager to insure health. Avoid these sites at all cost.

Of equal importance are the carcinogenic contaminants found in apparently healthy food fish, all possessing harmful

levels of heavy metals, PCBs, insecticides, herbicides, defoliants, etc. Questionable sites include drainages (pond, lake or stream) located on or with "watershed" (areas in which water flows downhill, either surface visible streams, or subterranean-percolation-moving through porous stratum gravels and sand) near industrial/chemical/manufacturing plants that discharge wastes and cooling waters. Other sites to avoid are municipal sewer discharges (often containing large amounts of heavy metals and toxic wastes, especially if there is no pre-treatment, as the majority of municipal waste water plants are not equipped to do so), near dumps or sanitary landfills, and near areas of intensive agriculture where the use of fertilizers, insecticides, herbicides and woody plant defoliants is prevalent (farm crops, fruit trees, golf courses, powerline rights of ways). These man-made contaminants enter the aquatic food chain, and finally end up in the fin fish's flesh. Of interest to the forager, is that a particular fish's dietary habits will limit or vary the amount of toxicity in its flesh. Meat-eating predator fish (largemouth bass), consume smaller fish that have absorbed these waste. Each upward "rung" in the food chain ladder results in more concentration, right up to man on the end of the food chain. Basic vegetable-eating fish like carp tend to have less concentrations of waste.

Other important considerations include the fat contents of a given fish species. Usually the higher the fat count, the more the tissues "hold" the wastes. In addition, the age of the fin fish will help determine the waste levels in the flesh. The longer a fish resides in such an environment, the greater its toxic level. In a survival scenario, a moderately polluted river might harbor edible fish of vegetative eating habits under 2 years of age which are unsafe for consumption by resident predator fish and perfectly edible fish of migratory origin (i.e., shad, salmon, etc.) that have not "lingered" for sufficient time in the polluted environment to taint the flesh. Again the degree of toxicity in the fish flesh will determine the safe/unsafe consumption rate. Some fish will be off limits at all times (except during crucial survival scenarios), others will be safe for moderate consumption (once a week but still off limits to pregnant/lactating women), and still others will be fit for everyday use by all. The ideal fish producing locale is a "clean" one, but foragers will not always have this choice.

Yes or No—When considering a potential fish species for survival food from a questionable source, if the source is well populated with fish and readily accessible in your domain, it is strongly recommended that tests be performed by a recognized laboratory on the said fish *before* the actual need arises. Heavy metals, exotic chemicals, along with traces of agricultural chemicals may be above

established federal or state safe limits.

Pollution, in a variety of sources (thermal, oxygen demanding, inert silts, chemicals, etc.), provides stress on the freshwater aquatic environment to a varying degree depending on the type and quantity induced, rate of dispersal, and physical and biological characteristics of the water system. If freshwater sources are possible food suppliers, check to see if species and quantities desired are available for harvest as *pollution* effects the type and volume of fish present. For example, a non-polluted-appearing trout or smallmouth bass stream of eastern Tennessee might seem to be a site for sustained fish production. A closer examination reveals acid seepage from an abandoned coal mine. The excessively acidic waters produce nil in fish biomass with a slight, gradual increase in fish biomass and diversity (types) as stream miles accumulate (downstream). The first 2 miles downstream from the pollution source contain no appreciative fin fish, miles 3 to 5 display a steady increase in suckers and other rough fish, miles 6 to 8 show a mixed population of rough fish and bass, miles 9 to 12 indicate a higher percentage of game to rough fish ratios (trout begin to appear in the census). A full 20 miles downstream, the waters have diluted sufficiently to create a "balanced" clean stream fish population. Check your potential food sources out *before* the potential food crisis.

Acid Rain is a form of airborne pollution (originating from industrial emissions and to a lesser degree, from internal combustion motors) that precipitates from the sky via rain or snow into streams, lakes, etc. This increased acidity lowers the pH levels in many waters effecting the productivity of it. Many waters are prone to lower, or elimination of, fish production, resulting in no fish populations ("dead" lake).

The serious forager should contact his regional department of environment health to determine the safety of fish in question. If they fail to provide this essential information, consult a private laboratory.

The Gear—The extent of deployment of fish gear type and methodology will vary, controlled by a variety of factors including gear availability, degree of site security, and finance.

As stressed in a previous article on salt-water fishing for survival (*SG*, Sept. 1984), the rod and reel are very effective fish capture devices. Basically the equipment can be broken down into the following categories for survivalist use:

1) General all purpose *spinning gear*—6½-foot medium action fiberglass, graphite, or combo (mixture of glass and graphite) spin rod (i.e., brands such as Shakespeare Ugly Stick, Garcia, Berkley Lightning Rod, or custom rods fabricated with Lamiglass blanks), matched to a 6-to-10-oz. spinning reel (open face design such as Penn 720, Garcia Mitchel 300), combined

with two spools, one filled with line of 6-pound test, the other 12-pound (brands—Ande, Berkley Trilene, Dupont Stren).

2) Universal conventional rod/reel combo—5½-to-6-foot graphite/fiberglass of medium/medium heavy action rods (Berkley "lightning" or "Stinger"), a casting reel of magnetic or centrifugal anti-backlash construction, weighing 6-to-10 ounces (Shimano #250, Gracia Ultra Mag II, etc.), filled with monofilament testing line between 12 and 17 pounds test.

3) General purpose flyrod—8-to-8½-foot medium action rod of fiberglass, graphite (or composition of both), two-piece construction for mobility and storage (Berkley "Lightning Rod" #LR40, Shakespeare "Ugly Stick" #FY 1100, Fenwick #FF856), a single action fly reel equipped with a fish fighting drag (Pflueger "Medalist" #1494, 1494½, 1495, Martin MG-7, MG-75), matched to an appropriate weight line (#6, 7, 8, 9 Courtland 333, 444 or Air/Wet Cell of fast-sinking specifications). If resources allow, procure two extra spools, one with a floating line, another with sinking tip constructed line.

4) Heavy weight spin and conventional outfits to handle large catfish, salmon, stripers (fresh water) and sturgeon. A survivalist forager in quest of these "giants" will need a Penn spin reel #650SS or #750SS matched to a 8-to-9-foot medium action spin rod (Fenwick #PLS 965) filled with 17-to-25-pound test monofilament; a Penn #500SM conventional reel attached to a 7-foot custom Lamiglass rod, line 30-to-40-pound test mono; a Garcia Ambassador #7000, filled with 25-to-30-pound test mono, attached to a 9-foot medium action Lamiglass rod.

Makeshift fishing rods ("poles") are readily fabricated from whippy tree branches or saplings cut 6-to-12 feet in length. Add a section of line (monofilament, Dacron, Nylon, etc.) equal to the length of the pole and tie to the end. Manufactured cane (bamboo) and fiberglass poles suitable for survival angling, include, B&M Co. (P.O. Box 231 West Point, Miss. 39773) Rigged Pole #TL 103 10-foot, three-piece and Fish Pole Reel Combo FPC 12-foot, complete with reel and 25 feet of 12-pound test monofilament line. Such poles excel at catching schooling and spawning panfish (bluegill, crappie, etc.) that frequent weed beds, brush piles, lilly pad areas, etc. One drops bait, fly, popper, etc., after strike set hook and haul 'em out. This is a popular fishing method of lower midwest/southern states adaptable nationwide.

Bait—General purpose spinning and casting gear adapts to the presentation of both artificial as well as natural baits.

Live bait (fresh dead) selection and deployment for a representative group of species (trout, bass, pike and other predators), for survival purposes, are broken down into three main categories: insect

Continued on page 64

SURVIVAL TOOLS



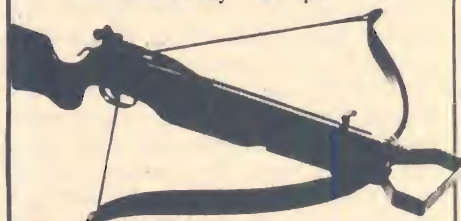
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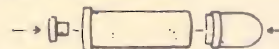
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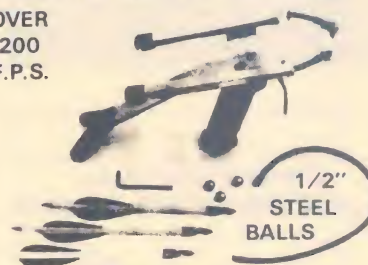
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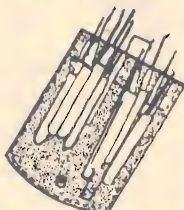
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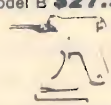


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FRESHWATER FORAGING

Continued from page 63

(terrestrial or "land based" and aquatic or "water based"), live fin fish ("minnows" and immature game/rough), and "critters," including worms, frogs, leeches, mice, etc.).

A general rule that applies to most live bait presentation (angling technique) is that "delivery" should be as natural as possible. For example, an emergent floating aquatic insect can be hooked and floated drag free down a trout stream. One simply "peels off" line at a slightly faster rate (inch/feet per second) than the stream flow (velocity), without the aid of sinkers. On "still" or quite slow flowing waters (ponds, lakes, sluggish rivers), a live bait fish (shiner, small panfish, sucker, etc.) can be "Live Lined" or allowed to swim freely at will without the aid of a float (bobber). Peel off the line at a slightly greater rate than the swimming bait demands while the bait fish "covers" fish holding structures (i.e., edge of rock piles, weed beds, etc.). If one notices the live bait fish zooming away from a potential fish holding structure, or it tries to hide under the boat, it could mean a fish or school of 'em are out there. Get the bait back out there as soon as possible. Special care must be afforded to prevent the bait from "hiding" in rock and weed clumps.

Live worms (garden and nightcrawler variety), fresh dead (or preserved) bait fish (i.e., shiners, "minnows," small panfish, suckers, etc.), live/dead aquatic insects, and fish eggs can be presented with appropriate size hook in stream situations and can be drifted drag free as explained beforehand. On occasion, small lead split shot or diminutive rubber core sinkers (1/16-to-1/4 oz.) will be needed to insure proper depth presentation.

Hooking procedures vary with bait selection. A live lined worm is many times "threaded" to conceal the bulk of the hook, leaving the point and barb exposed for quick hook set (penetration) with a tad of wiggle to entice the fish. On "still" waters, a bait may be lowered either with or without the aid of additional sinker weights. Many times, the use of a bobber/dobber is employed to "suspend" the bait or keep it off bottom, thus giving rise to higher visibility for "cruising" fish. Use the smallest possible float (bobber) to suspend the bait. It will offer the least fish-alarming resistance during the "strike."

Live worms or bait fish can also be trolled with or without the aid of sinkers and spinner blades for a variety of species. Single or tandem treble hooks are used, along with single point or "harness" rigs. In all cases, a mechanically (i.e., outboard) powered, muscle (oars, paddles) powered, or wind propelled (sail) boats

provide the motion medium. The lines are deployed aft with the baits being "dragged" along enticingly.

Other popular live baits include mice live lined to monster pike and muskies. A live field mouse or vole is hooked via a snug fitting elastic band around the rodent's mid section and it is then lobbed out near a fish holding area. For walleyes, leeches can be fished, drag-free drifted with or without the addition of lead weights, or trolled with harnessing spinners ("June bug" type).

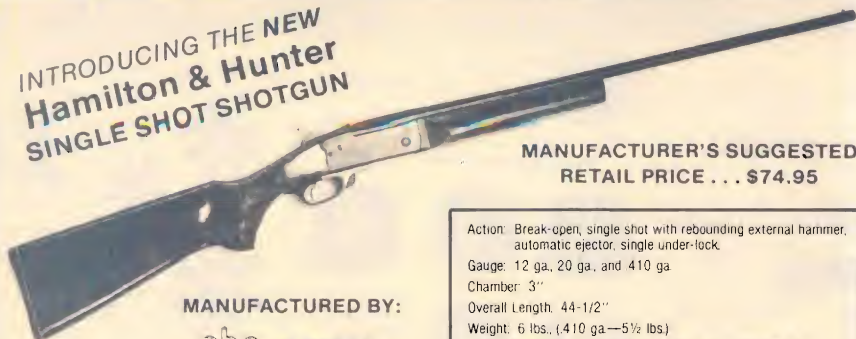
Chucks or steaks of expired panfish/rough fish (perch, sunfish, sucker, etc.) are excellent bait for the larger species of catfish (yellow, blue, etc.). Chunks can be fished on bottom with or without the additional weight. Always try to use the lightest possible weight the angling situation offers, taking into account water velocity and casting distance if applicable.

The freshwater species sought, combined with rig selection (size of bait, bait piece, hook, line strength, etc.) will determine the technique and timing of fish hooking, i.e., a foot-long stream trout will gobble a lively 2½-inch earthworm drifted on a No. 12 bait style hook quite rapidly before it washes by. After several "taps" or bites are perceived up the line, the angler should lower the rod, wait for the line to tighten, then lift the rod tip smartly but not enough to break the 2-to-6-pound test line commonly used in trout angling, thus setting the hook. A similar trout residing in more placid waters of a pond/lake will have more time to "eyeball" the bait than its stream relative. The bites might be noticeably more feeble, and a longer wait before setting the hook could be in order.

An 8-inch live shiner fished for a 20-pound northern pike demands a slightly different angling approach. The pike charges and splashes wildly, then finally seizes the live bait fish in a torpedo rush. The pike now swims off with the shiner crosswise in its maw. To attempt to "set" the hook now will result in a missed fish. The experienced angler will allow the fish to swim off, line in free spool, until the line pay off stops. Then the pike will "turn" the shiner head first, headed for its gullet, then swim off, forcing the ill-fated shiner toward its gullet. After the second run commences, lower the rod and when the line tightens hit 'em hard. The 20-to-30-pound test line used will not part. Don't forget the wire trace leader to deter the pike's dentures.

Other natural baits of use to survivalists include dead poultry, fish and other animal carcass parts (entrails, livers, etc.). These are good baits for large midwestern/southern catfish, with usual mode of capture being hand lines, trotlines or traps. ●

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BOOK REVIEWS

(Continued from page 10)



Solar Greenhouses and Sunspaces: Lessons Learned; Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; 35 pages, paperback; \$2.25.

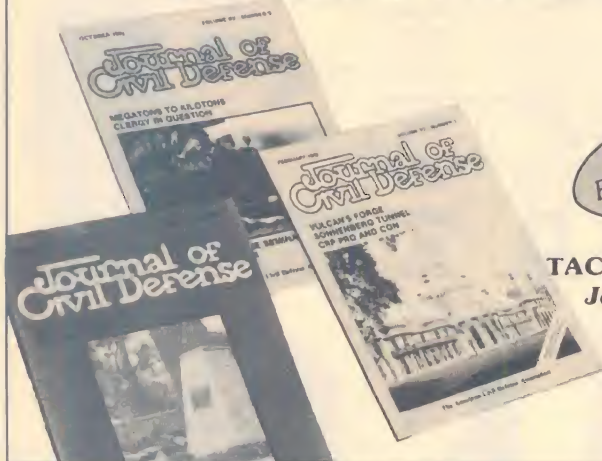
Prepared for the U.S. Department of Energy's Appropriate Technology Program, this booklet is one of a series that focuses on appropriate technologies and their application in the home and workplace. *Solar Greenhouses and Sunspaces* is an abstract of selected solar projects introducing new ideas and technology. The projects were undertaken with grants from the DOE. Greenhouses and sunspaces are popular. They can provide heat, save energy, harness energy and produce food. Despite these advantages, many greenhouses do not perform as well as they should. As more and more are built, used and observed, more ways of improving them are developed. The experiences of the DOE grantees provide valuable information for others for building and operating better greenhouses and sunspaces. The booklet is divided into six main categories: design; construction tips; management, maintenance and safety; horticulture; greenhouse construction workshops; and information sources. The booklet was developed as a supplement to existing literature on the subject to help prospective sunspace/greenhouse owner/builders get started in the right direction. It is not a textbook. Its purpose is to identify common mistakes in design, construction and/or operation and provide useful advice to help consumers avoid problems. For those interested in utilizing solar technology for home or business, this publication has much to offer.

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Tax Havens in the Caribbean; Paladin Press, Dept. ASG, P.O. Box 1307, Boulder, CO 80306; 52 pages, paperback; \$8 plus \$3 postage and handling.

This is a reprint of a report prepared jointly by the Treasury Department, Internal Revenue Service and the Justice Department as part of the requirements of the Caribbean Basin Economic Recovery Act of 1983. The act required the Treasury Department to report to Congress on the extent to which Americans use Caribbean tax havens to evade or avoid federal taxes, the effect on federal revenues, and the anti-tax haven enforcement activities of the Treasury Department. Information collected and presented in the report shows the use of such tax havens, significant for several years, has continued to rise. The level of offshore banking in the Caribbean Basin countries rose sharply in the five years prior to 1982. Claims of Caribbean banks on nonresidents rose from \$178 billion in 1978 to \$318 billion in 1982. Liabilities to nonresidents rose from \$178 billion to \$315 billion. The report concludes that it is very difficult to measure the use of illegal tax havens due to the nature of the transactions and difficulty in obtaining information from most tax havens. "Nevertheless," the report states, "it seems reasonable to assume that a great deal of activity designed to violate the tax and other laws of the U.S. takes place in the Caribbean Basin tax havens." This report cites examples of recent cases which illustrate a variety of possible illegal uses of havens. ●

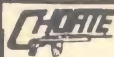
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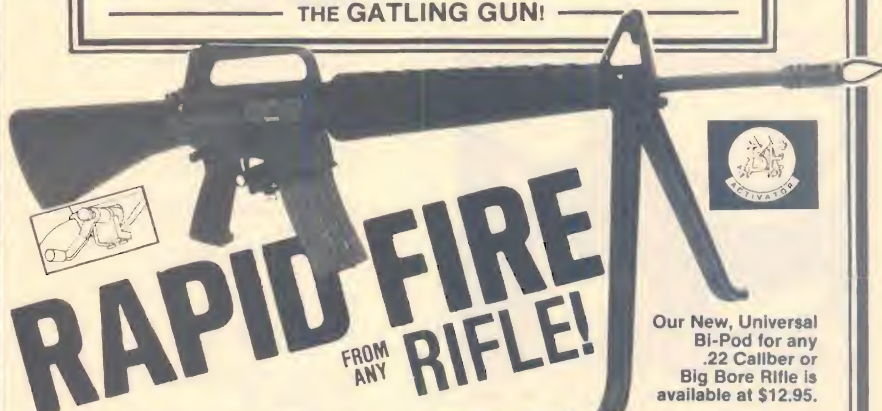


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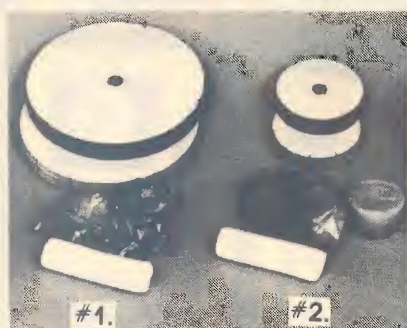
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matic food preservers, such as refrigerators and freezers, are the single strongest link in the chain that ties us to central utilities. A thermostat is an automatic switch that requires a constant supply of energy. You can use gas refrigerators, or you can buy battery-driven standard compressor models. The best bet, however, is to build your own out of scavenged auto parts—but that's outside the scope of this article.

The only way to effectively handle intermittent drains is to store the products. Heat can be stored by simple mass, like water or rock boxes, but electrical storage depends on batteries. Right here, though, we run into a paradox—most generator sets are not designed for heavy rate battery charging. There are two solutions to this problem: plug in a heavy duty charger or mount an alternator. There are advantages to each method; you get more amps for your dollars with the belt-driven unit, but the transformer provides a reliable interface between your personal grid and the public utility.

If you add up the wattages of your appliances and power tools, you can reach a staggering total, far in excess of any affordable generator set. Our collection, for instance, comes to about 13,000 watts, but we have lived comfortably using a three kilowatt set. The secret to this is time sharing and load switching. Kitchen appliances are not normally used at the same time as laundry equipment, and a switch that allows the use of one, but not both, eliminates accidental overloads. Raw heat, such as hot water and room conditioning, are not sensible electrical loads; those B.t.u.s are available elsewhere. With adequate switching and thermal scavenging, your volt vendor need only be equal to one or two large appliances simultaneously.

In a shaded, well-insulated house, air conditioning is necessary only on the hottest days—and then only part time. When the air conditioner is needed, schedule other uses, such as charging or cooking, to eliminate waste. Using direct current (DC) for lighting gives you instant fail-safe lights, without wasteful part-load running. By using inverters, it also allows the use of electric tools, if the main energy source fails. At one time, our main engine ate one of its valves, and the water pump failed on the backup. While I repaired the machinery, the batteries gave us lights, power tools, refrigeration—and even music—until both of them were back on line.

Roll Your Own—When you roll your own electrons, you are just one short circuit away from the 19th Century, but the problem is fixable in your own powerhouse, not hundreds of miles over the mountains in a frozen turbine. As more of us learn to create our own energy systems, the drain on the central plants will be reduced and, by the end of the century, they could be the backup for a nation of independently powered individualists. ●

Continued on page 74

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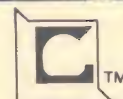
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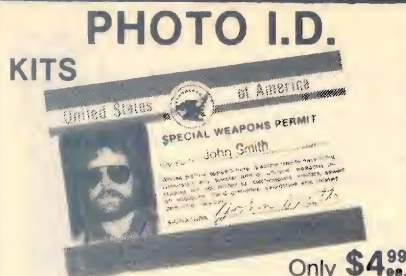
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—EXPLOSION—

Continued from page 45

lodged electrical circuits combining with a fuel source, such as a broken gas pipe. In the second example, there is a distinct possibility that the explosion itself could produce a fire, particularly when easily ignitable materials such as furniture and draperies are present.

High-yield explosions generally include commercial explosives, such as TNT, dynamite, nitroglycerin and ammonium nitrate, and black and smokeless powders when confined.

Low-yield explosions generally include explosions or ruptures of containers of flammable liquids and gases, combustible dusts, pressure vessels, and black and smokeless powders when unconfined. Low-yield explosions can also include back-draft explosions in which concentrations of smoke particles ignite during a fire.

Liquids, Gases—Flammable liquids and gases can frequently produce explosions. They possess four interdependent properties which determine whether an explosion can take place. These are flashpoint, explosive limits, ignition temperature and vapor density.

Flammable liquids do not burn or explode themselves. It is the vapor rising from the liquid surface which, when mixed with air, forms the explosive mixture. The temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air is called the liquid's flashpoint.

The range of mixture of air with a flammable gas or vapor from a liquid that will explode (that is, burn rapidly) is relatively narrow for most gases and vapors.

Below a certain percentage, by volume, a mixture of flammable gas or vapor with air will be too lean (lacking sufficient fuel) to explode. Above a certain percentage, the mixture will be too rich to explode. The lower percentage and the upper percentage are called the explosive limits. For gasoline, for example, the limits are about 1.3 percent to 6.0 percent. For natural gas or methane, the limits are 5.0 to 15.0 percent. These limits apply only at normal temperature and atmospheric pressure.

Before a flammable gas or vapor/air mixture can ignite, the mixture or at least a small portion of it, must be raised in temperature. The temperature necessary to produce the ignition is called the ignition temperature. While the mixture may occupy a large volume, if the total mixture lies within the explosive limits, a very small spark occurring anywhere within the mixture's volume can produce ignition of the total mixture.

The vapor density of a flammable vapor or gas is usually measured relative to that of air. A substance with a vapor density of



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—EXPLOSION—

2, for example, is twice as heavy as air. The vapor density and subsequent behavior of the vapor or gas discharged into the air can be extremely important. The vapors of a liquid which are heavier than air tend to sink to the lowest possible level. They can flow out over considerable distances while forming concentrations within the explosive limits. On the other hand, those that are lighter than air tend to rise, and thus remove themselves from possible ignition sources at lower levels.

So, leaking propane gas is more likely to cause an explosion in the basement of a house, where ignition sources are low, than leaking natural gas. If natural gas is confined, however, as in a basement from which it cannot escape, and if the leak continues, then ultimately the basement will be filled from the ceiling to the floor with gas. If there is an ignition source near the floor, the resulting explosion may be more violent, due to more gas being present.

Combustible Dusts—Combustible materials in solid form, when ignited, burn relatively slowly, releasing energy gradually. The rate of burning and ease of ignition are generally dependent on the ratio of the surface area to volume of the material exposed to air. The greater the volume to surface area, the more difficult it is to ignite and the slower it burns. As the combustible material is reduced in size, the easier it is to ignite and the more readily it burns. If the combustible material is reduced to a powder or dust and is intimately mixed with air through mechanical agitation or through blowing, the dust cloud, if ignited, can burn so rapidly an explosion is produced.

Combustible dusts include agricultural dusts, coal dusts, chemical dusts, metal dusts, rubber dusts, pesticide dusts and dusts from plastics manufacturing. There are hundreds of dusts capable of producing dust explosions, but agricultural dusts have been responsible for the more spectacular and destructive explosions.

Combustible dusts, like flammable vapors and gases, have finite explosive limits. For most combustible dusts, the lower explosive limit is around 0.02 ounces suspended in 1 cubic foot of air. The upper explosive limit is less well defined.

As with flammable vapors and gases, combustible dusts must contact an ignition source to explode. This ignition can be from a small spark, open flame, or hot surface. Many combustible dusts can be ignited by hot surfaces in the range of 750 to 1,100 degrees Fahrenheit (399 to 593 degrees Celsius).

Dust explosions, while not as common as flammable vapor/gas explosions, tend

Continued on page 72

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-EXPLOSION-

Continued from page 71

to be a hazard in certain types of structures, including grain elevators, flour mills, candy factories, paint manufacturing operations and metal powder plants.

Dust explosions produce damage effects similar to flammable gas/vapor explosions. Walls can be dislodged or blown out and buildings may collapse. Combustible dust explosions, unlike flammable gas/vapor explosions, however, can produce a chain of explosions. The first explosion may be rather small in intensity, but it may raise additional clouds of dust, resulting in another, more severe explosion, which in turn could lead to yet a bigger explosion, and so on.

Gunpowders—Fires involving small arms ammunition with smokeless powder are not unusual. They can occur in a gun store or a sporting goods store, or in a home where the owner has stored ammunition. But these fires are not as dangerous, from an explosion standpoint, as some people believe they may be.

Smokeless Powder—Actually not entirely smokeless—won't detonate when exposed to heat. In a fire, cartridges may explode individually, not all together. When the cartridge explodes, its bullet may move a few inches at most, and its brass case may fly a bit farther, as an uncontained explosion permits gases to escape in all directions. In the bore of a firearm, the bullet is propelled by channeled, contained gas pressure, and it can escape in only one direction.

One can still be injured or killed when close to an exploding cartridge, however, so keep clear of a fire with exploding ammunition. It is not necessary to evacuate to a great distance away. A solid wooden barrier, or mound of earth will provide adequate protection. Caution: this does not apply to burning cartridges *inside* firearms. A loaded gun's bullet exits the barrel with velocity identical to that when it is discharged by a firing pin.

Black powder, on the contrary, is extremely hazardous when exposed to heat. Many experts consider black powder to be among the most dangerous of the more commonly used explosives. While black powder burns at a slower rate than high explosives, it still burns rapidly when ignited, and in dry form, it is easily ignited. The ignition temperature of black powder is so low that the slightest spark will set it off at normal temperatures. The static electricity from a charged human body has been known to explode it. A sufficient wetting of black powder with water will destroy its ability to burn or explode. When storing it, make sure there is plenty

of water available nearby in case it is needed.

Black powder is seldom used today as a propellant except by sportsmen. However, it is still used in some primers, safety fuses, airplane flares, some hand grenades, practice bombs, blank cartridges, fireworks and signals. When transporting, storing or handling black powder, make sure it is kept cool and away from electric ignition sources.

Other Considerations—While explosives vary widely in strength, each possesses different characteristics, and each will react according to several factors affecting it.

One of these factors or variables is the degree of pressure or confinement. A second is the intensity of heat needed to ignite or detonate the explosive. A third variable is the degree of shock sensitivity. These variables tend to be interrelated.

Shock sensitivity of a particular explosive can be affected by the amount of heat it absorbs and the pressure on it.

Most high explosives require the shock of a more sensitive explosive to set them off. But at a high enough temperature, every explosive will explode. Every explosive can also explode after prolonged exposure to somewhat lower temperatures. Keeping them as cool as possible when storing, transporting or handling them reduces the probability of explosion.

Blasting Caps—A commonly misunderstood explosive, the cause of many injury accidents, is the blasting cap. Caps are used widely to set off high explosive charges in mining and construction. They are pencil diameter metallic casings, available in varying explosive intensities and in configurations for fuse or electrical detonation. Many are pressure- or impact-sensitive.

The Institute of Makers of Explosives says, "More than 100 million blasting caps are used every year in the U.S. for construction and building, mining and quarrying . . . A few of the 100 million caps . . . become lost . . . or stolen. And when they get into the wrong hands, the results can be tragic. When handled improperly, blasting caps can cause serious injury . . . even death. They can rip your face, blow off your fingers, put out your eyes, and make you deaf. So, if you find one, don't touch. You may end up with nothing to touch with . . ."

Explosives Transportation—Explosives are subject to a number of federal, state and local government regulations when transported by rail or on public roads by common carriers. These are too numerous to cite here, but a brief mention of some

regulations is in order.

The Bureau of Explosives of the Association of American Railroads has established classes of explosives, based on their relative dangers:

- Class A explosives will either detonate, or, as in the case of black powder, present a maximum fire and/or explosion hazard. Class A explosives are subdivided into nine groups according to form, chemical composition and ease of detonation. The class includes black and smokeless powders, dynamite, nitroglycerin, TNT, amatol, picric acid, and blasting caps. Also included are cannon and rocket ammunition, grenades, bombs, mines and torpedoes.

- Class B explosives function, in general, by rapid combustion rather than detonation. Once initiated in these materials, a fire is impossible to extinguish until they are consumed. The hazard presented here is primarily one of fire. Included in this class are special fireworks, some types of ammunition and flash cartridges as well as most smokeless powder propellants.

- Class C explosives may contain restricted amounts of Class A or Class B explosives. This class of explosives is considered to present minimal hazard. Examples are rifle and pistol ammunition, explosive rivets, common fireworks, fuses, smoke signals and flares.

If an accident involving these classes of explosives occurs nearby, make sure authorities are notified immediately. If possible, care should be taken to prevent the spread of any fire, or to prevent damage from further explosions. If a fire has started near these explosives, make every effort, without endangering lives, to extinguish the fire and remove undamaged explosives to a safer location.

The recommended evacuation distances for accidents involving these explosives are: Class A explosives, 1 mile; Class B explosives, 1/2 mile; and Class C explosives, 1,500 feet.

There are also *forbidden* explosives which cannot be shipped by common carrier by rail freight, rail express, highway or water. These include explosive compositions that ignite spontaneously or undergo marked decomposition when subjected for 48 hours or less to a temperature of 167 degrees F (75 degrees C); explosives containing ammonium salt and a chlorate; liquid nitroglycerin, diethylene glycol dinitrate; and leaking or damaged packaged explosives.

The U.S. Department of Transportation requires that placards identifying the class of explosives be placed on vehicles carrying any quantity of them, except Class C ex-

plosives which do not require placarding.

Home Explosions—In a discussion of explosion dangers, it is necessary to mention some common household perils.

Avoid using flammable liquids such as gasoline, acetone and butane for anything other than their intended purposes. Many of these materials begin evaporating at room temperature, and the vapors can easily ignite and explode. Read and follow label instructions and warnings.

Aerosol cans, such as hair spray and insect repellent, are potential bombs. Many of their sprays are easily ignitable and explosive. Never use them near a heat source and store them in a cool area according to manufacturer's directions. Do not puncture or handle them violently.

Maintain water heaters, gas boilers or other equipment with steam pressure safety valves in good working condition. A faulty or plugged pressure release valve could lead to a blast that kills or maims. *Never* block off these valves as a few ignorant persons have to keep them from dripping water: they were meant to do just that.

Some dry chemicals can combine with other substances found in the home to produce toxic and volatile compounds. Again, follow label instructions and warnings and keep children away from these substances.

Awareness—As stated earlier, potential explosions are almost everywhere. Some explosions, criminal bombings and oil refinery disasters, for example, cannot always be anticipated. However, awareness of the *potential* for an explosion can help the individual to anticipate and prepare.

Those who live close to manufacturing plants, chemical industry complexes, truck terminals, and other repositories of explosive substances would do well to study what is being manufactured/transported/stored nearby and what steps have been taken by the owners to avoid explosions and/or respond to an explosion should it occur.

If one's residence is in the vicinity of such industrial developments, where the odds favor an explosion/fire in the future, it would be wise to develop a family contingency plan in the event of such a disaster. Make sure you have the necessary first aid equipment, protective shielding, an escape/evacuation route or other items to survive the effects of an explosion, be it a small one in the home or a massive one at a local industrial facility.

Learn which kinds of explosives are in the specific locale, learn the explosive potential of such substances, and then learn how to deal with an explosion and its aftermath, should such an event occur. ●

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SURVIVAL FOOD—Also for campers, hunters, RVs, home, etc. Not dehydrated. No refrigeration. Five-year shelf life. Taste like MOM's. Ten-entre variety pack \$48. (Money order only) EARL RUSSELL, Dept. ASG, 581 Locust, Hazeltown, PA 18201.

REAL ESTATE

RURAL FARM RETREAT—71 acres, two houses, spring water, barns, woods, creek, state highway 16 miles to town, absentee income, non-target area. Shaw, Dept. ASG, Box 235, Star Route 586, Monticello, KY 42633. (606) 348-6871 nights.

NEW MEXICO RETREAT—Secluded 160 acres, approx. 25 miles S/W of Taos on Rio Grande Gorge. (707) 539-7643.

MISCELLANEOUS

INDEPENDENT ELECTRICITY—Photovoltaics, batteries, inverters, powerplants, control panels, 12-volt items. RADIO EQUIPMENT available. CATALOG: \$4. Kootenai Radio & Energy, Dept. ASG, Box 215-A, Kootenai, Idaho 83840.

MILITARY SURPLUS—All genuine G.I. surplus. Canteen 1 qt. O.D. \$2.75 new, ICI nylon canteen cover O.D. \$6 new, poncho O.D. \$7.50 used, all PPD, catalog flyer \$1 (refundable). D.E. Beery, Surplus, Dept. ASG, P.O. Box 6216, Chilllicothe, OH 45601.

FIREWORKS, ALL KINDS—We ship all year. Catalog \$1 refundable on first order. UNCLE SAM'S FIREWORKS, Dept. ASG, Rt. 3, Box 78, Ennis, TX 75119.

INDIANA JONES STETSON HATS—We have the authentic hat. Deluxe fur felt (used in films) \$49.95. Wool felt adult sizes \$24.95, boys sizes \$19.95. State size. Also related Raiders gear. Add \$3 shipping. CA residents add 6% tax. Adventure Supply, Dept. ASG, 24285 Sunnymead Blvd., Suite 274, Sunnymead, CA 92388.

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-GENERATOR-

Continued from page 69

Three Necessary Things:

GENERATOR ANATOMY

Move a magnet past a coil of copper wire . . .

BEFORE DISSECTING a power plant, we have to know how electricity is generated. To make electrons travel, move a magnet past a coil of copper wire. These are the only three things necessary to generate electricity: a conducting wire, a magnetic field and motion between the two. It's that simple. Think of the energy between the poles of a horseshoe magnet as a "field" of energy, and the generating windings as a cylinder of copper wire spinning end over end in that field. Put an iron core in the cylinder and the output goes up 2,500 times.

Every time the coil of wire or "armature" turns between the poles of the field, the current induced by the magnet reverses. This is known as alternating current (AC). The strength of the field and the number and size of the windings determine the voltage and amperage. Think of electricity as water flowing in a pipe. Voltage is equivalent to pressure and amperage is equivalent to volume. Each end of the windings terminate in a metal collar called a slip ring. In order to transfer current from them to your house wiring, two carbon blocks called "brushes" are used.

If the windings or "armature" are turning at 3,600 r.p.m. in the field we get 60 "cycles per second" of electrical flow, which is the normal housepower that most of our appliances need. Double the number of poles (think of two magnets) and the speed of rotation can be cut to 1,800 r.p.m. and still produce the 60 cycles per second 110 volt alternating (AC) we are hooked on. This makes the generator larger, heavier and more efficient, and it will operate much longer between sets of bearings and brushes.

Since delivering thousands of watts through a moving contact invites problems, engineers decided to make the generating windings stationary and to rotate the magnetic field, because only a few hundred watts are necessary to create a magnetic field.

Generators can be made as two bearing units with self-supported rotors or as single bearing rotors which depend on a coupling to the engine flywheel for support and power. The single bearing unit forces the engine to turn at generator speed to get 60 cycles per second and, for a two-pole set, this means 3,600 r.p.m. This is too fast for durability. The most simple and reliable energy plant is a two bearing 1,800 r.p.m. unit which can accept power from a variety of sources.

Note: When switching back and forth between the utility company and your generator set, a safety switch has to be used. There must be no possibility of your wiring being inadvertently connected to the outside line. If you are cross-connected to the outside, three things can happen. First, when the commercial grid comes back on, it will melt your generator. I have seen this happen. It is expensive. Second, you will be attempting to electrify your neighbor's house through the outside line. Third, if there is a lineman up on one of the lines that you're powering, he will get a 15,000 volt shock.

MAIL CALL

Beet-Spinach

I have grown a variety of greens for four years called "Leaf Beet Perpetual Spinach." Its taste is a combination of both flavors. It has stayed true to strain. Viability is for at least four years, with high germination rating, and in our area it has survived 20 below. A person can plant in spring, summer or fall, and the following year it goes to seed abundantly. It does not bolt in summer heat of 100 degrees plus, and, if mulched lightly, you can pick leaves almost year-round. I have grown it in poor soil and rich soil, attended and unattended, and it has come through like a champ. The only reference I have seen on this plant is listed in John Seymour's *The Self Sufficient Gardener*. I have a limited supply of the seed that I will sell to anyone interested at 10 seeds for \$2 and SASE. I will include a brochure on my experiences with it. You'll never have to buy seeds again. I also have a cherry tomato seed that survives, left unattended, to reproduce and ripen on its own within our season (90 to 120 days). It has a true tomato taste, not sweet like most cherry tomatoes, and is very prolific. I will sell these at 5 seeds for \$1. Anyone interested write:

Rose Dane
P.O. Box 15175
Boise, ID 83715

Anyone interested? We think so! Seeds that run true year after year are of great value to those who are planning to be self-sufficient after a crisis. Thanks, Rose.

Preservation Society

We are the Self Preservation Society and we're looking for survivalists from across the continent who are interested in joining a survival group. We're a small Canadian group with big goals, like the construction of an underground self-sustaining complex for use in case of nuclear war or worse. To begin with, an explanation as to why the organization exists. Quite simply, we believe that some form of world-wide breakdown is inevitable. Be it a nuclear war, famine, or a new energy crisis, the result will be the same: complete anarchy. Therefore, we are looking for several like-minded people interested in putting their time, effort and money into assuring their continued existence in the event of a world-wide disaster. So, if you wish to know more about SPS, please contact us at the following address.

John R. Erwin
9 Anwoth Road
Westmount, Que.
Canada H3Y 2E6

Anyone interested, readers? ●

BACK TO SCHOOL SAFETY

Continued from page 49

school, but when the child is taken to large public gatherings, e.g., amusement parks, shopping malls. Make certain the child is always in sight and also carries full identification.

Adam's Case—The famous case of Adam Walsh, the murdered child whose father, John Walsh was instrumental in bringing about legislation relating to crimes against children is a tragic example of child abduction. Adam was abducted from a crowded Florida shopping center and murdered. The large crowds and commotion of a shopping center are ideal camouflage for criminal intent.

Legislation implementing new child crime prevention programs is growing in popularity not only because it fills a need, but because it is "cost effective," a hard fact of modern government. For example, the recent case of a 3-year old girl who was kidnapped and missing 10 months cost the counties of San Francisco and Contra Costa in California over \$400,000 in investigation expenditures. That amount of money can run full-scale prevention programs in both counties. This is not to say the money was not well spent, but that prevention is the ideal over the solving of crimes.

"Safety proofing" whole communities via prevention programs is not the final answer but goes a long way.

Authorities are firm on their stance that shouting and other loud noises can deter criminals. Encourage children to be versed in that technique. However, relative to resisting with physical force, the general opinion is, at least for younger, smaller children, that forceful resistance may not be effective, and may anger the criminal. However, in a life threatening situation, force cannot be excluded even if it be skin kicking and such.

For older children and teens, community self-defense courses are available which teach martial art techniques that, with sufficient practice, can be effective. Check recreation department programs for course information.

Attitudes—Parents, as well as their children, need to pay special attention to their overall attitudes regarding safety. The "it can't happen to me" attitude is a dangerous complacency that can lead to tragic results. Remember, victims are not always "someone else."

For more information contact:

The National Center for Missing and Exploited Children, 1835 K. Street, N.W. Suite 700, Washington, D.C. (202) 634-9821. (If you have information about a missing child, call 1-800-843-5678). ●

AD INDEX

Alpha Team	72
Steve Arnold's Gun Room	64
Assault Systems	9
BMF Activator, Inc.	67
L.L. Baston Co.	67
China Diesel Imports	3
Core Resource	68
Delta Press	70
Desert Publications	61
The Dutchman	23
Dynamit Nobel of America, Inc.	21
The Edge Co.	51
F.I.E.	66
Feather Enterprises	22
Freedom Arms	59
Great Lakes Distributing	69
Guaranteed Distributors	71
Guillory & Assoc.	7
House of Weapons, Inc.	72
INCO	10
The Journal of Civil Defense	66
Kaufman's West, Inc.	
Army & Navy Goods	C/3
Keystone Security Products	75
Lifeknife, Inc.	71
Lincoln Log Homes	70
M & M Enterprises	45, 63
Magnum Research, Inc.	37
Midwest Sports Distributors	11
Niho Land & Cattle, Ltd.	69
North American School of Firearms Repair	73
Pacific Cutlery Corp.	17
Paladin Press	5
Paralex Corp.	C/4
Pocket Survival	C/2
Provisions Unlimited	8
Rambo Surplus	6
Seattle Film	3
Smoky Mountain Knife Works	72
Southern Survival, Inc.	73
Sport Access-Ammo Dump	65
Survival, Inc.	18, 19, 39, 40, 41, 42
Survival Books	64
The Survival Center	69
West Coast Cutlery	68
Yellowstone Basin Properties	72

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Steer Clear:

POISONOUS PLANTS

Many common vegetables and fruits have parts which, if eaten, are potentially lethal . . .

By Margarita Mondrus Engle

SOCRATES KNEW he was eating poison hemlock. Yet its appearance is so similar to that of wild parsley that many unsuspecting hikers have been killed inadvertently.

Castor beans provide the valuable medicine, castor oil, but they also contain one of the most toxic compounds known to man.

Acorns were the staple food of most California Indian tribes. Manioc is still the primary food of many South American Indians. Both acorns and wild manioc contain toxins which must be leached before they can be safely consumed as food.

Close relatives of edible species are often poisonous. Sweet peas and rosary peas are botanical relatives of edible cultivated peas, but both are potentially lethal. One

rosary pea seed is enough to kill a child. The seeds of sweet pea can cause paralysis if ingested.

Poisonous death camass bears a close resemblance to wild onions, but lacks the onion's distinctive odor.

The tomato plant is a native of the Americas, where Aztecs, Mayans and Incas cultivated it for millenia. After the conquest of Mexico, tomato seeds, along with their Aztec name, *tomatl*, were taken to Morocco via Spain. Eventually the tomato reached Europe, where it was known first as Moorish apple, and later, because of reputed aphrodisiac effects, as love apple. Even after it was taken back to America by European colonists, the tomato was planted only as an ornamental, never as food. No relative of the deadly

nightshade was considered edible. Not until the nineteenth century did this superstition vanish. Ironically, the green parts of tomato plants are somewhat toxic.

The potato is another close relative of deadly nightshade. Native to the South American Andes, potatoes were introduced into Spain in 1534, and were sold for as much as \$1,000 per pound, as a remedy for impotence. Eventually, the potato was recognized as a food, although its obvious resemblance to nightshade made its acceptance a very cautious one. In 1728, in Scotland, cultivation of potatoes was prohibited by law.

European cautiousness was not unmerited. The shoots, berries and sun-green tubers are, in fact, toxic. Green potatoes contain a much higher concentration of solanine, a poisonous alkaloid found in very low concentrations in all potatoes. Any potato will turn green after exposure to the sun. "Potato poisoning" is signaled by vomiting, diarrhea, paralysis and death. Green potatoes should never be eaten, even when thoroughly cooked.

Many other edible plants can be lethal if the wrong part is eaten, or if unripe fruits are consumed.

The fleshy parts of nutmeg fruits provide a popular spice, yet two seeds can be fatal.

Seeds of most stone fruits contain cyanide-bearing compounds, including the controversial laetrile, an extract of apricot pits. Seeds and leaves of apples, apricots, cherries, peaches and plums result in dizziness, coma and death if eaten in quantity. This danger is an easy one to forget, since many recipes for apricot preserves include use of toasted apricot pits, which add a tasty, nutty flavor to the jam.

Rhubarb is another tricky cultivated species. The stalk, or petiole, of the rhubarb leaf (the long, narrow portion which resembles a stalk of celery) is a popular food item. The blade, or wide, flat portion of the leaf, is extremely dangerous, due to concentrations of toxic oxalic acid.

Elderberry shrubs grow wild throughout much of the United States. Ripe berries are edible, and are used for making preserves, pies and wine. Indians made a drink from the berries, and dried and stored berries for winter use. The flowers were also eaten, and were used as an anti-septic. However, many of the books on

COMMON POISONOUS PLANTS: A PARTIAL CHECKLIST

The following is only a small sample of the numerous dangerous species which surround us:

WILD POISONOUS PLANTS

Common name	Scientific name of genus
Baneberry	<i>Actaea</i>
Bracken fern	<i>Pteridium</i>
Castor Bean	<i>Ricinus</i>
Death camass	<i>Zigadenus</i>
Dogbane	<i>Apocynum</i>
Jimsonweed	<i>Datura</i>
Locoweed	<i>Astragalus</i> and <i>Oxytropis</i>
Lupine	<i>Lupinus</i>
Milkweed	<i>Asclepias</i>
Mushrooms	<i>Amanita</i> , <i>Lepiota</i> , etc.
Poison hemlock	<i>Conium</i>
Nightshade	<i>Solanum</i>
Spurge	<i>Euphorbia</i>
Tobacco	<i>Nicotiana</i>
Water hemlock	<i>Cicuta</i>

CULTIVATED POISONOUS PLANTS

Common name	Scientific name of genus
Azalea	<i>Rhododendron</i>
Buttercup	<i>Ranunculus</i>
Daffodil	<i>Narcissus</i>
Delphinium	<i>Delphinium</i>
Dumbcane	<i>Dieffenbachia</i>
Fava Bean	<i>Vicia</i>
Foxglove	<i>Digitalis</i>
Lily-of-the-valley	<i>Convallaria</i>
Mistletoe	<i>Phoradendron</i>
Morning-Glory	<i>Ipomoea</i>
Oleander	<i>Nerium</i>
Peony	<i>Paeonia</i>
Philodendron	<i>Philodendron</i>
Poinsettia	<i>Euphorbia</i>
Privet	<i>Ligustrum</i>
Yew	<i>Taxus</i>



ABOVE—Poison hemlock (*Conium maculatum*), a relative of carrots and parsley, is abundant along streams.



ABOVE—Castor bean (*Ricinus communis*) contains two toxic components, a glucoside and an alkaloid. Castor oil, widely used in medicines, is safe.



LEFT—Jimsonweed (*Datura meteloides*), a relative of the tomato and potato, was widely used by North American Indians as a medicine and vision-seeking drug. It is extremely poisonous. A slight overdose causes death.

wild edible plants neglect to mention that unripe berries, leaves and wood are all poisonous, causing vomiting and diarrhea. Southwestern Indians made flutes from branches by thoroughly drying them, then boring holes with a hot stick. Yet some of the books which mention this procedure fail to point out that children are sometimes poisoned by using fresh twigs as whistles.

Fava beans, or horse beans, are perhaps one of the most unusual toxic cultivated plants. These seeds, relished by many, cause fetal hemolytic anemia, or "favism," in others. Some individuals of Mediterranean and African descent lack an enzyme needed for proper digestion of the fava bean. The ability to consume fava beans is, therefore, an inherited trait.

Types of Poisons—Most of the toxic compounds found in plants can be classed as having one of four basic modes of action:

1. Poisons affecting the brain. These may cause mental disturbances such as narcotic reactions.

2. Poisons affecting the spinal cord. These may result in paralysis or convulsions.

3. Heart rate depressants or stimulants.

4. Irritants affecting skin, nervous system or digestive tract.

Many plant poisons can be placed in one of the following chemical categories, each with a characteristic mode of action and potential for treatment using antidotes:

1. **Alkaloids.** These are very common, and include such familiar compounds as caffeine, nicotine, codeine and atropine. Alkaloids affect the nervous system, and may produce either acute or chronic reactions. Common alkaloid-bearing plants include poison hemlock, tobacco, nightshade and locoweed.

2. **Glycosides.** These are non-toxic crystalline compounds which, when broken down by enzymes in the body, yield

toxic compounds. Cyanogenetic glycosides are the most common type. These break down to release hydrocyanic acid, a cyanide-bearing poison which causes cellular asphyxiation, i.e., inadequate transport of oxygen within body tissues.

3. **Acids.** Many organic acids have toxic effects. Oxalic acid triggers kidney failure. Tannic acid, the toxic component of acorns, can do the same.

4. **Resins, oils and acrid juices.** These are complex materials which may irritate the skin or nervous system. Some of these compounds appear as a white, milky sap. The milky resin in milkweed stems and leaves is toxic, as is the milky juice of euphorbias (spurge), including the popular Christmas ornamental, poinsettia. Cicutoxin, a resinoid found in water hemlock, is the most deadly plant toxin found in the United States.

Safety Rules—There are no foolproof methods of avoiding poisonous plants. ▶

POISONOUS PLANTS



The spurges, or euphorbias, contain toxic compounds in the milky sap.



ABOVE—Three tobacco (*Nicotiana glauca*), a native of South America, is commonly found in the United States. Death may result within minutes of consuming it.

LEFT—Baja Nightshade (*Solanum*) is one of many species of poisonous relatives of the potato. All have this distinctive star-shaped flower.

However, a few simple precautions are essential whenever wilderness survival is attempted.

1. *Avoid eating any unfamiliar plant, or any part of an edible plant other than the part known to be safe.* If consumption of wild plants is unavoidable, accurate plant identification is crucial. Authoritative plant identification books should be consulted. Hastily compiled edible plant manuals may be incomplete, or inaccurate. Some background in botany is useful. Most floras, or regional plant identification books, are quite technical. Remember, plant identification is serious business. One mistake can be fatal.

Herbals should be used with caution. Many valuable medicinal herbs are lethal if administered in slightly larger doses. A good example is the Indian tree, *Strychnos nux-vomita*. Its seeds are the source of natural strychnine, an ingredient of many old-fashioned tonics. Jimsonweed, common throughout the Southwest, was

valued by many Indian tribes for its medicinal and vision-seeking hallucinogenic properties, yet fatal overdoses were relatively common.

2. *Be wary of wild plants which closely resemble cultivated ones.* Remember the nicknames of poison hemlock ("poison parsley") and water hemlock ("poison parsnip").

3. *Don't experiment with mushrooms.* Only experts should collect wild mushrooms for the table. Knowledge of the structure and classification of mushrooms is essential. Sophisticated spore-identification techniques are used to distinguish between toxic and edible species.

4. *Look for warning signals.* Milky sap frequently indicates poisonous resins and juices. There are, of course, exceptions. Lettuce develops a harmless milky sap as it ages.

Many poisonous fruits are brightly colored. The brilliant baneberry is poisonous, as is the striking red and black rosary

pea, frequently used in jewelry. These fruits can be especially attractive to children, for whom lethal doses may be very small.

5. *If poisoning occurs, seek medical aid immediately.* Be sure to take a sample of the plant suspected of causing the problem. If possible, give the doctor an entire plant, including roots, stems, leaves, flowers and fruit, not just the part which was ingested. Other plant parts may be essential for rapid identification by a trained botanist or poison control specialist. Without proper identification, selection of an appropriate antidote may be impossible.

If medical aid is unavailable, make an attempt to identify the plant accurately, and rely on a good medical manual for treatment and antidotes. Base your choice of treatment on the general type of poison, i.e., alkaloid, glycoside, organic acid or resin. Specific plant species will probably not be listed in a medical reference. ●

BATTLE DRESS UNIFORM (BDU) —

GENUINE GI

Originally worn in the jungle of Vietnam, the general features of the GI combat battle fatigues are as follows:

Pants—cut full for complete freedom of movement these feature drawstring cuffs and adjustable pull tab waists. For maximum utility, they are constructed with 6 pockets, 2 of which are large bellowed cargo pockets, on the thigh.

Shirt/Jacket—also cut full, these rugged versatile fatigues feature 4 pockets (2 breast pockets and 2 huge bellowed hip).

Sizes—military waist sizes are XS, S, M, L, XL. Length sizes are regular and long. Not all length sizes are available in a particular style. For best fit, please tell us your waist, chest, inseam and height and we'll try to find the right size for you. Remember that jungle fatigues fit completely different than a pair of jeans.

Woodland Camouflage Pattern BDU's — GENUINE GI

These 50% cotton, 50% nylon fatigues are the latest issue to all services. In these Woodland BDU's the military has combined complete utility and freedom of movement into garments made to last for years of hard wear.

The fabric combination of breathable, comfortable cotton combined with the nylon seems to make them indestructible. The seat and knees in the pants, and the elbows in the jackets have been reinforced. The bellows pockets are even roomier than the jungle fatigues that were the predecessor to the BDU. These are a best bet for the hunter, sportsman or outdoorsman who wants clothing that he can depend on season after season. **Brand New.**

Specify: Jacket or Pants \$30.00/each; \$57.50/set.

Desert Camo Pattern BDU's — GENUINE GI

These day desert pattern BDU's are the current issue to the US Rapid Deployment Force who have been trained for warfare in the Middle East. These are designed exactly like the Woodland Camouflage Pattern BDU's described above, complete with reinforced knees and seat. **Brand new. Specify: Jacket or Pants \$34.00/each; \$65.00/set.**

Olive Drab (OD) Green Jungle Fatigues —

These were one of the first jungle fatigues used in Vietnam. **GENUINE GI** They were phased out in the late 1960's and early 1970's. These 100% cotton ripstop fatigues are currently being manufactured under a government contract to the original military specs. **Brand new. Specify: Jacket or Pants \$30.00/each; \$57.50/set.**

Tiger Stripe Camouflage Pattern BDU's

These are made by a US Government contractor to military specs. The tiger stripe pattern is true. They are reinforced as the Woodland Pattern BDU's above. Regular lengths only (no long). 50% cotton 50% nylon.

Brand new. Specify: Jacket or Pants \$34.00/each; \$65.00/set.

Solid Black BDU's

A favorite of SWAT teams, these fatigues were manufactured in the US by a government contractor to military specs. 50% cotton/50% nylon, these are reinforced as the GI Woodland Pattern above. Regular lengths only (no long). **Brand new.**

Specify Jacket or Pants \$34.00/each; \$65.00/set.

Urban Camouflage Pattern BDU's —

A strikingly different camouflage, our urban camo may be the SWAT alternative to the solid black or woodland camo. The Urban pattern? Well, visualize a leaf or woodland design with the colors being various shades of grey and solid black. Now you can understand why we say it's a striking alternative to the uniforms you've seen.

Our Urban Camo BDU's are durable, easy care 50% cotton/50% polyester fabric and are manufactured in the USA to military specifications. So, the pants have a reinforced seat and knees, the jacket has reinforced elbows. Also featured are: pull tab waist, drawstring cuffs, covered buttons and the attention to every small detail which you've come to expect. **Brand New. Sizes: XS, S, M, L, XL.**

Regular Lengths — Specify: Jacket or Pants \$34.00/each; \$65.00/set
Long Lengths available in Pants only S, M, L. Add \$3.00

Woodland Camouflage Pattern BDU's —

Lightweight, Warm Zone Wear — 100% cotton, Ripstop

One of the loudest complaints voiced by our troops during and after the US incursion into Grenada was that the fatigues they were wearing were too heavy and warm. No wonder — the GI Woodland BDU's are half cotton/half nylon and constructed to be for general use year-round. So, in a warm, humid climate they could seem almost oppressive especially to troops pursuing an activity as strenuous as fighting a war.

After Grenada the US military quickly designed lightweight BDU's for wear in Warm Climate Zones. Kaufman's has secured an over-run of fatigues under consideration for issue to all troops. Our lightweight BDU's are made in the USA (of course) by a military contractor. They offer all the features of the Woodland BDU's, standard weight. That is, they are in the Woodland Camouflage Pattern and feature reinforced knees and seat, pull tab waist, drawstring cuffs, quality construction, covered buttons, etc. The lightweight fatigues however are 100% cotton, woven in a ripstop design. So they are lightweight, cool and comfortable, yet very durable.

Presently our Warm Zone Lightweight Woodland BDU's are available only in regular lengths (no long). However, in time long lengths may become available, so feel free to call our Customer Service Department on our toll-free line to learn about our current inventory. **Brand New. Specify: Jacket or Pants \$30.00/each; \$57.50/set**

Used Camouflage Jungle Fatigue Jackets —

We have a limited supply of used, leaf pattern camouflage fatigue jackets. These are the old style, used in Vietnam, and so are in the 100% cotton ripstop fabric.

All of the jackets we have on hand are size small. These used Camo Jungle Jackets are Grade II's, which means each jacket has been repaired and some of the repairs are very noticeable. However, each jacket is completely serviceable and we have cleaned them after the repairs were made. Kaufman's guarantees your satisfaction so you can buy with confidence. **Sizes: Small only. Length:**

Short \$9.75/each
Regular or Long — (Note — longs are very limited. Advise us when ordering if we may substitute a regular length if we are sold out on long) \$12.75/each

Used, OD Green Jungle Fatigues —

limited supply available — exactly as above, in excellent condition, cleaned and repaired as necessary.

Pants

Short length — small or medium waist \$18.75/each
Regular or long length — small or medium waist — (Note — long lengths are in very short supply. Advise us if you can accept a regular length if we are sold out on long. Large and extra large waists are not available) \$22.75/each

Jackets — Only size extra small and small are available

Short length \$14.75/each
Regular and long length — (Note — longs are in short supply. Advise us if you can accept a regular length if we are sold out on long) \$19.75/each

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GENUINE GI

This is a high intensity strobe beacon which penetrates rain and fog and is visible for distances up to 15 miles. Standard pilot survival gear, this light is about the size of a pack of cigarettes (1" x 2" x 4 1/2") yet it puts out a dazzling white flash (250,000 lumens) 50 times per minute for up to 9 hours. The unit is waterproof and shockproof. Sold complete with case and 1 battery \$39.50/each.

☐ Replacement Batteries for Strobe Light. \$10.75/each.

ALL ORDERS SHIPPED WITHIN 24 HOURS

Jungle Hats — US Military Issue —

These "Bonnie Hats" are the real thing!! Brand new, complete with brass screened cycles, cartridge holder hat band (except the Desert Camo) and chin strap.

Specify size: S7; M7 1/4; L7 1/2; XL7 3/4.

- ☐ Leaf Pattern camouflage, GI ripstop; 100% cotton as used in Vietnam; Genuine GI \$14.00/each.
- ☐ Woodland Pattern camo, army's latest issue; 50% cotton/50% nylon Genuine GI \$12.25/each.
- ☐ Desert camouflage; just issued to the U.S. Rapid Deployment Forces. 50% cotton/50% nylon; Genuine GI \$12.25/each.
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